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Heat Transfer Analysis of Localized Heat-Treatment for Grade 91 Steel

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HEAT TRANSFER ANALYSIS OF LOCALIZED HEAT-TREATMENT FOR GRADE 91 STEEL

by

Jacob D. Walker

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ABSTRACT

Heat Transfer Analysis of Localized Heat-Treatment
for Grade 91 Steel

by

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Utah State University, 2017

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Many of the projects utilizing Grade 91 steel are large in scale, therefore it is necessary to assemble on site. The assembly of the major pieces requires welding in the assembly; this drastically changes the superior mechanical properties of Grade 91 steel that it was specifically developed for. Therefore, because of the adverse effects of welding on the mechanical properties of Grade 91, it is necessary to do a localized post weld heat treatment.

As with most metallic materials grade 91 steel requires a very specific heat treatment process. This process includes a specific temperature and duration at that temperature to achieve the heat treatment desired. Extensive research has been done to determine the proper temperatures and duration to provide the proper microstructure for the superior mechanical properties that are inherent to Grade 91 steel. The welded sections are typically large structures that require local heat treatments and cannot be placed in an oven. The locations of these structures vary from indoors in a controlled environment to outdoors with unpredictable environments. These environments can be controlled somewhat, however in large part the surrounding conditions are unchangeable. Therefore, there is a need to develop methods to accurately apply the surrounding conditions and geometries to a theoretical model in order to provide the proper requirements for the local heat treatment

procedure. Within this requirement is the requirement to define unknowns used in the heat transfer equations so that accurate models can be produced and accurate results predicted.

This study investigates experimentally and numerically the heat transfer and temperature fields of Grade 91 piping in a local heat treatment. The objective of this thesis research is to determine all of the needed heat transfer coefficients. The appropriate heat transfer coefficients are determined through the inverse heat conduction method utilizing a ceramic heat blanket. This will be done through an inverse method by collecting actual data from different conditions and temperatures. Then the heat transfer coefficients are used to set up a model to determine the appropriate post-weld heat treatment conditions for Grade 91 steel. This will enable one to use the derived coefficients to run a forward analysis with the specific geometry and conditions they will encounter in the heat treatment process for their application. The analysis will provide a theoretical determination of time and temperatures needed to maintain the temperature for the proper time needed to properly heat treat the welded section in the desired areas that have been joined together through a welding process. Finally time and temperature combinations are compared with experimentally measured data. The forward model code applied to the parameters of the heat-treatment can then appropriately assist to determine the proper post-weld heat treatment conditions for the desired toughness and creep properties.

This research is very beneficial to the joining of metals industry because it provides a way to ensure the method used to heat treat the welded section is being properly done, and the required heat treatment is achieved. It is applicable to many different geometries so that it can be modified to specific situations.

(161 pages)

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Many of the projects utilizing Grade 91 steel are large in scale, therefore it is necessary to assemble on site. The assembly of the major pieces often requires welding in the assembly; welding drastically changes the superior mechanical properties of Grade 91 steel that it was specifically developed for. Therefore, because of the adverse effects of welding on the mechanical properties of Grade 91, it is necessary to do a localized post weld heat treatment.

In this study a localized post weld heat treatment is used to gather experimental data. The data is then used to derive unknown heat transfer coefficients that are necessary for theoretically modeling heat treatments. With the derived coefficients that have been found one can theoretically model heat treatment scenarios specific to the situations and provide results that are reliable and provide insight as to what parameters will provide the best results.

This research is very beneficial to the joining of metals industry because it provides a way to ensure the method used to heat treat the welded section is being properly done, and the required heat treatment is achieved. It is applicable to many different geometries so that it can be modified to specific situations.

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ACRONYMS

PWHT	post weld heat treatment
HTC	heat transfer coefficient
IHCP	inverse heat conduction problem
HAZ	Heat affected Zone
FCC	Face centered cubic
BCC	Body centered cubic
OIT	Outer insulation temperature
HBT	Heat blanket temperature
OPT	Outer pipe temperature
IPT	Inner pipe temperature
AIPT	Air inner piper temperature

CHAPTER 1

INTRODUCTION

The development of Grade 91 steel began back in 1979 by Oak Ridge National Labs for the breeder reactor and has been further developed by other researchers since then [1]. Grade 91 steel is composed of modified 9% Cr and 1% Mo; it is classified as either P91 for plate or piping and T91 for Tubing. Grade 91 steel was developed because of a need for greater creep properties and oxidation resistance at high temperatures [2], because of its superior material properties it has been increasingly used in the power generation and nuclear industries. Grade 91 suffers a great loss in material properties when welded. Therefore, Grade 91 must be properly heat treated following the weld operation in order to adequately restore the material properties so that design requirements are met.

Grade 91 steel is a martensitic Cr-Mo steel that has been micro alloyed with vanadium and niobium and has a controlled nitrogen content. After welding, brittle martensite with unfavorable material properties is formed in the weld metal. Thus, heat treatment is required in order to produce tempered martensite with precipitated carbides and vanadium/niobium-rich carbo-nitrides, which provide for acceptable material properties [3].

For heavy sections and assembly joints made in the field, the post weld heat treatment (PWHT) usually cannot be conducted using the optimal procedure. As a result, the creep and creep rupture properties of the joints maybe compromised [4].

According to Newell [5], a number of different parameters must be considered during the implementation of a PWHT process. First, the lower critical transformation temperature must not be exceeded. This requires that the chemical composition of both the base and filler metals be known so that the lower critical temperature (A1) can be estimated. Next, the required duration of time at temperature is dependent upon the thickness of the material. With data suggesting that thin sections (thinner than 13 mm, or 0.50 inch) can be tempered in 15 to 30 minutes while thicker sections should receive a minimum of 2 hours

at temperature. Finally, the time between welding and PWHT should be kept to a minimum in order to reduce the possibility of cold cracking. These general guidelines produce a framework for industry procedures but do not fully quantify the effects of variance from these guidelines [4]. Therefore, it is necessary to further study the effects of the local PWHT process to better quantify the required PWHT process so that superior material properties are not compromised following a welding operation. The study will be using a ceramic heat blanket as the heat source, which is a typical method of local PWHT.

1.1 Statement of the Problem

Many applications for the use of Grade 91 steel are large in scale; therefore it is necessary for "in the field" or on site preparation and assembly. In the field, optimum conditions can rarely be achieved for the welding, assembly, and PWHT of the different needed components. Therefore, in order to apply an appropriate PWHT to the welded section, a ceramic heat blanket is applied to the area of interest and a heat treatment is then performed. The industry recognized standard for PWHT parameters of Grade 91 steel currently dictates an ideal temperature of 760 C (1400 F) for two hours but the feasibility of maintaining these precise conditions during actual fabrication is questionable due to fluctuation in temperature and environmental conditions. Therefore what is needed now is a model that will assist in the determination of a proper PWHT that would incorporate a heat blanket as a heat source and actual "in the field" conditions that will achieve the same results as an optimum PWHT in an oven.

1.2 Statement of the Purpose

In Industry the feasibility of maintaining the precise PWHT conditions that is currently dictated is questionable, therefore, the purpose of this study is to provide engineers with an understanding of the effect of using ceramic heat blankets on heavy welded sections in the field. The sub-purposes of this study are as follows:

1) To provide a list of procedures and parameters for the preparation of the PWHT process using a ceramic heat blanket.

2) To provide the equations necessary to determine the proper Heat transfer coefficient.

3) To produce a model that shows the temperature field induced by the heat blanket.

4) To determine the proper heat treatment temperature and time from the model produced.

1.3 Statement of the Need

There are several reasons this study is needed. First, the industry's desire to continually better understand the effectiveness of using a ceramic heat blanket for the PWHT process in the field. Second, to ensure the process meets the strict guidelines for an adequate PWHT to achieve the desired material properties of Grade 91 Steel. Finally, to have a reliable model that can help to obtain the proper PWHT parameters for specific situations and various applications to help the industry to expand.

1.4 Statement of the Hypothesis

This research will use the method of an Inverse Heat Conduction Problem (IHCP) to determine the heat transfer coefficient (HTC) that would be appropriate for the boundary conditions. Many researchers have found great success in using the IHCP method to derive and determine the HTC for many different situations and materials. Using the IHCP method to find the HTC for Grade 91 steel can be determined when using a ceramic heat blanket. Once the HTC has been determined it can then be used by the forward model analysis to simulate a heat treatment process. The HTC determines how the heat will be transferred to the steel and then the heat transfer rate can then be calculated through known material properties and finally an appropriate soak time can then be applied to ensure a thorough PWHT. This could then be used in many other weld applications of steels, such as T-joints and complicated shapes using a heat blanket as a heat source for the PWHT.

The research will begin by gaining actual data through PWHT of Grade 91 steel sections with thermocouples welded to the surface of the material. This will provide good data for what the surface temperature with respect to time is. This actual data gathered from various tests will be used in the IHCP method to solve for the HTC. Since we already know

the material properties for Grade 91 Steel and the other necessary properties the HTC's can be determined.

Many applications can be derived from the method to be used. The method being used is a pipe section under a ceramic heat blanket with insulation blankets that allow the required temperatures to be reached. This method will help to determine the appropriate boundary conditions to use in many other applications such as using a block or tube section.

1.5 Statement of the Assumptions

The following assumptions are identified in the pursuit of this research study:

1) The Grade 91 material for the design of experiments (DOE) are to be taken from a single stock material to ensure a similar chemistry and mechanical properties.

2) The strict material certification for Grade 91 steel ensures that the results will be acceptable for other Grade 91 steel projects.

3) The parameter setting ranges of the ceramic heat blanket would be adequate for producing the desired temperature for the desired time period.

4) The Model reduces to one dimension, due to a substantially large length compared to the thickness of the material and axisymmetric conditions.

1.6 Statement of the Limitations

Due to equipment available, no other heating method shall be used. Thermocouples are limited due to data acquisition equipment. One piece of pipe was used for the study due to material limitations. Finally the data sets were collected in a lab indoors due to the lack of availability of off-site equipment and an off-site location.

1.7 Significance of the Work

This research will be beneficial because as a structure is put into place and the sections are welded together, the steel must retain its superior material properties. This can only be achieved through a proper PWHT this can be achieved using a model that uses proper HTC and realistic environmental conditions.

CHAPTER 2
LITERATURE REVIEW

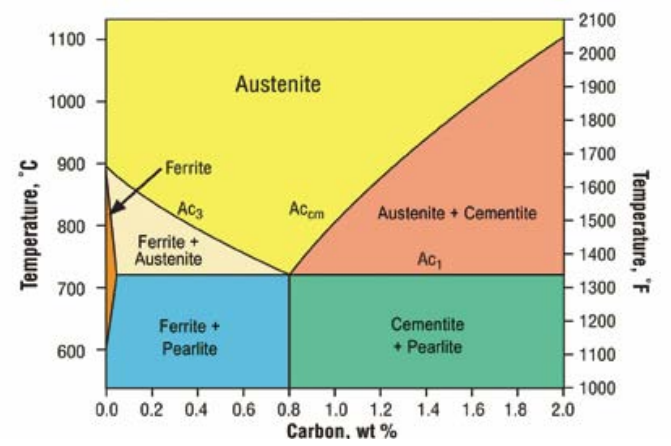
2.1 Post Weld Heat Treating

PWHT is defined as any heat-treatment after welding used to improve the properties of a weldment. The need for PWHT is driven by code and application requirements as well as the service environment. In general, when PWHT is required, the goal is to increase the resistance to brittle fracture and relaxing residual stresses. Other desired results from PWHT may include hardness reduction, and material strength enhancements. [6]

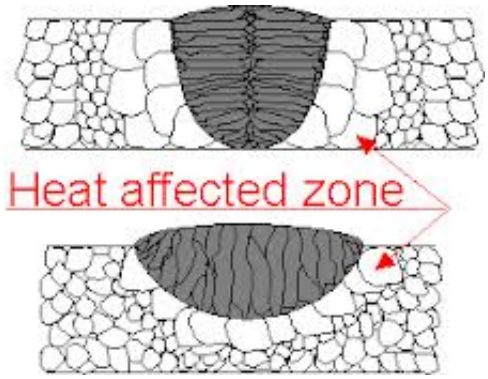
2.1.1 General Heat Treating

Heat-treating is a process that alters the mechanical properties and sometimes chemical properties of a material. A typical heat-treatment consists of heating to a certain temperature and then holding for a certain duration, following this hold time the item is then quenched with some sort of fluid, which may consist of air, water, oil, and other fluids. With a proper heat-treatment and temper a person can control the hardness, strength, and ductility of the material according to the desired and needed material properties. This is very important since a large range of applications exist, with different limitations and requirements. Heat treating involves three important factors that are based upon the chemical composition of material that you are heat treating such as temperature, duration of soak time, and method of quenching. Each of these factors will be discussed in the following paragraphs in this section. The focus will be on heat treating of steel alloys and in particular Welded Grade 91 Steel.

Due to the different heat-treatment procedures of different materials the focus will be on that of heat treating steel due to the fact that Grade 91 is a steel and to simplify the information. The heat-treatment process of steel consists of heating the steel into



(a) Iron-Iron Carbon Phase Diagram [7]



(b) Micro-Structure of a Weld and Grain Size with Respect to Location [9]

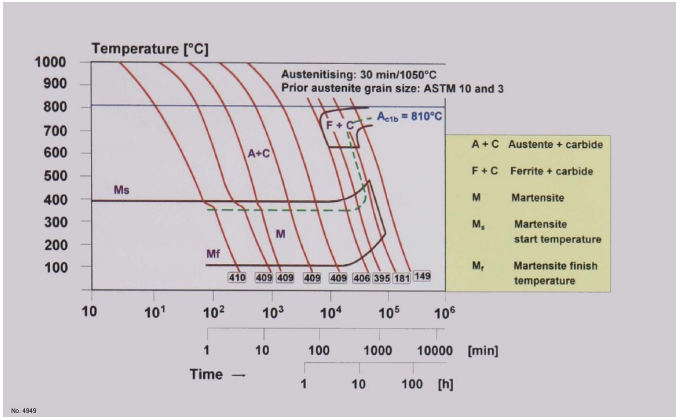
Fig. 2.1: Phase Diagram and Heat Affected Zone

the austenite range, that is, to a high temperature 840°C-980°C(1,550°F-1,800°F) [7]. The austenite range will vary with different materials and chemical compositions of that material. The way you find the austenite temperature is through phase diagrams such as in Fig.2.1a. The Iron-Iron Carbon phase diagram shows the material composition in Carbon wt % and temperature in °F or °C.

Two very important factors for being able to heat treat are the austenite to Ferrite Phase transformation and the solubility of carbon into the iron. Those two factors make it possible to heat treat steel. When the steel is in the austenite phase it has a face centered cubic structure (FCC) and in the ferrite phase it has a body centered cubic structure (BCC). The FCC structure can dissolve up to 2.14 wt % C whereas in the BCC structure it can only dissolve 0.022 wt % C [7]. This allows the steel to form a martensitic micro-structure. The hardness of a material is primarily dependent on the amount of carbon content in the steel, and after a heat-treatment, the micro-structure of steel is predominantly martensitic [8].

The duration of the heat-treatment is dependent on the material and the thickness of the workpiece. The process of heating the material to the austenite range can take various amounts of time depending on the thickness of the material and the thermal conductivity; this duration is called soak time. If the material is thick and has a low thermal conductivity, it will take a greater period of time for the heat to completely transfer through the entire

(a) Martensitic Micro-Structure [11]



(b) Transformation Diagram for T/P91 Steel [11]

Fig. 2.2: Martensite Micro-Structure and Transformation Diagram

workpiece; whereas if the workpiece is thin and has a high thermal conductivity the material will quickly reach a steady state temperature. A general soak time is usually at the rate of 1 hr per inch of thickness for specific soak durations refer to ASME and ASTM standards. Once the material has been thoroughly soaked and reached a steady state temperature the workpiece must then be quenched.

Quenching is the rapid cooling of a workpiece so that desired material properties can be obtained. It is necessary to rapidly cool the material so that low temperature phase changes cannot take place. This allows a martensite micro-structure to form as shown in Fig. 2.2a [8]. Martensite is formed in carbon steels by the quenching of austenite at such a high rate that carbon atoms do not have time to diffuse out of the crystal structure in large enough quantities to form cementite (Fe_3C). As a result, the austenite, transforms to a highly stressed structure supersaturated with carbon. [10]

To achieve the proper quench rate various quench mediums are used in order to increase the severity of the quench. Common mediums are air, brine (salt water), oil, and water. Temperature profiles, quench rates, and quench mediums are determined by the material and data collected from past research, which can be found in ASME and ASTM standards. Those values were determined by the phase diagrams and in depth research as shown in

Fig. 2.2b [11].

2.1.2 Post Weld Heat-Treatment of Grade 91 Steel

When sections of steel are welded together for high stress applications, PWHT is absolutely necessary with grade 91, 911, 92, and 122 weldments regardless of diameter or thickness [12]. In order to achieve the needed superior material properties that Grade 91 possesses. After the steel is welded together, the resultant material properties are no longer uniform over the span of the material. The base material far from the weld area is unaffected however as you approach the weld location the material properties will begin to vary and will be very different once you have approached the central location of the weld. From Fig. 2.1b [9] it is easy to see how the material properties are changing with respect to the distance from the weld location. The heat-affected zone (HAZ) has large grains which directly correlates to a lower yield and ultimate tensile strength of the material. This discontinuity in material properties is unacceptable in high stress and high temperature applications, since the optimum performance is achieved when the steel material properties are as uniform over all areas as they can be.

A PWHT process creates more uniform material properties over the entire area of the steel. This provides better performance in high stress and/or high temperature applications. In order to achieve the uniform material properties desired for the use of grade 91 steel the procedures in Table 2.1 need to be completed [13].

PWHT is one of the most important factors in producing satisfactory weldments [12]. The presence of vanadium and niobium makes the alloy very resistant to softening at normal tempering temperatures. As a result, these alloys are generally tempered at $1375 - 1400°F$

Table 2.1: ASME Code PWHT Requirements

Code	PWHT Temperature	Shortest PWHT Time Allowed
ASME B&PV Code Section VIII Div 1	1300°F (704°C) Minimum	15 Minutes
ASME B31.1 Power Piping Code	$1300 - 1400°F$ ($704 - 760°C$)	15 Minutes
ASME B31.3 Process Piping Code	$1300 - 1400°F$ ($704 - 760°C$)	2 Hours

(745 − 770°C) even though the ASTM and ASME specifications only require a minimum tempering temperature of 1300°F (704°C). A target temperature of 1400°F (760°C) is generally recommended in the technical literature to provide an optimum combination of strength, creep resistance, and impact toughness [13].

Temperature control during the tempering phase is critical, especially with regards to the maximum temperature attained. Depending on the concentration levels of various elements, especially with nickel and manganese, the lower critical temperature (where austenite begins to re-form) can fall below 1500°F (815°C). If adequate temperature controls are not utilized during the tempering heat-treatment, it is possible to form fresh austenite or ferrite during the tempering process. Upon cooling, any fresh austenite will convert to untempered martensite. The presence of either ferrite or untempered martensite will compromise the toughness and the high temperature properties of the material. Thus, strict temperature controls during this heat-treatment phase are critical, and care must be taken to ensure that the temperature does not overshoot during the heat-up portion of the cycle [13].

The American Welding Society has published a document entitled Recommended Practices for Local Heating of Welds in Piping and Tubing" [14]. This document gives recommended practices for heat-treating. The document gives detailed practices for the many different methods to heat treat; Induction Heating, Electric resistance heating, Flame heating, Exothermic heating, Gas flame generated infrared heating, and Radiant heating by quartz lamps. This study will focus on the method of Electric resistance heating. Electric resistance heating may not be the most effective or efficient method for all applications however, it is used in this study since it is a very common method used. When heat-treating a section of steel, there are a few very important factors that are necessary in order to achieve a proper heat-treatment. The first is monitoring temperature; there are a few different methods that can be used. One could use a visual determination of temperature by color. This requires skill and is not precise. Temperature-indicating crayons can also be used. These crayons and paints melt once a certain temperature is exceeded. This also is not precise because once the crayon melts there is no indication as to what the

temperature is exactly. One method used is to use an indicator that melts once a certain temperature is reached and the specimen is also marked with another indicator which is rated for a higher temperature and is not supposed to melt, however the exact temperature is not known and it is difficult to monitor the variations of temperature. The most precise method to use is utilizing thermocouples. This method provides precise indications of the temperature with respect to time, which allows the temperature to be monitored while heat-treating. Other methods that can be used area infrared instruments, bi-metallic switches or expansion bulbs. Another important factor is the control of heat loss during heat-treatment. In order to use energy most efficiently when heating the steel section a method of insulation is needed. Types of insulation that are commonly used are mineral wool, and ceramic fiber mats. The hottest parts of the steel section should be well insulated with an insulation that has a high insulating value or a low thermal conductivity. Also it is recommended that insulation is extended well beyond the hottest areas of heat-treatment in order to contain as much heat as possible. A good rule of thumb for insulation is to have the insulation three times as long as the heated band. The final thing that is important is the thermal cycle and width of the heating band. There are four parts of the heating cycle; heating rate, holding temperature, hold time, and cooling rate. These requirements may be fixed by the requirements of codes, specifications, or procedures. The heating rate can affect the temperature difference between the outside diameter and inside diameter. This difference will produce hoop stresses, the greater the heat rate the greater the hoop stresses. However, as long as no cracks are produced there is no harm done since the stresses are relieved during the holding period. Experiments have shown that the radial thermal gradient will not be excessive, regardless of heating rate if the width of the heat band is at least 5 times the thickness. The temperature and time at that temperature create specific material properties and has been studied as to which provides the best microstructure for certain applications. The cooling rate will also induce stresses into the steel section and therefore must be more closely monitored as to develop the material properties desired such as hardness or ductility. The insulation should not be removed until desired temperature is

reached unless a fast cooling rate needs to be achieved. It also may be necessary to continue to apply heat during the early stages of cooling if a slow cooling rate is necessary. The width of the heating band as mentioned above, as a general rule is 5 times the thickness of the steel section. Experiments have shown that the temperature gradient through the thickness is proportional to the width of the heating band on the surface, regardless of the thickness or diameter of the pipe and the type of energy source. Even when the general rule of 5t is followed a significant temperature gradient is possible in thick sections and therefore it is necessary to take into account what that temperature gradient will be.

CHAPTER 3

EXPERIMENTS AND MODEL

3.1 Set Up and Preparation

The experimental setup is a way to run different variations of heat-treatments and conditions so that accurate data can be obtained. The setup used for this research uses a section of Grade 91 steel pipe. Using this section of pipe, thermocouples are located in various locations that provide useful data that are used to determine the unknown coefficients.

3.1.1 Equipment

Fig. 3.1: Lincoln Electric TIG 375 Welder

Heat Source: Lincoln Electric TIG 375 Welder was used and coupled with a ceramic heat blanket

- Max Amps: 41
- Max Voltage: 75

Fig. 3.2: Ceramic Heat Blanket

Ceramic heat blanket dimensions

- Width: 4.25” (0.108 m)
- Thickness: 0.5” (0.013 m)
- Length: 29” (0.737 m)

Insulation: White 1 in (0.0254 m) Cerablanket, this insulation is used for high temperature applications and can withstand temperatures up to 2000°F (1093.33°C) with a very low

Fig. 3.3: Insulation, Cerablanket

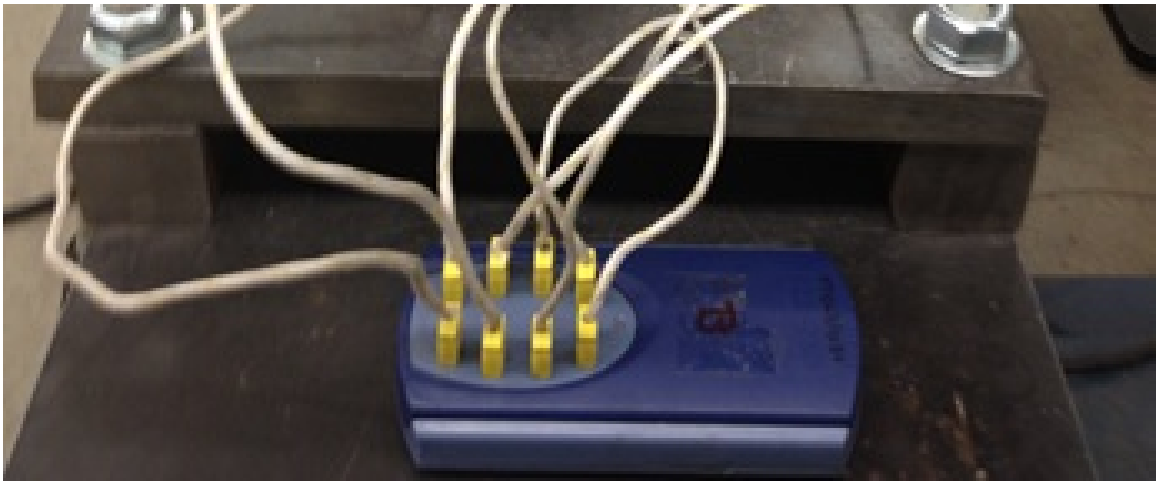


Fig. 3.4: Data Acquisition System, Pico Data Logger

thermal conductivity. Insulation was required to achieve a proper simulation of temperature as well as maintaining the temperature for a given duration. The insulation is wrapped around the entirety of the pipe, as well as capping the ends of the pipe.

Pico Data Logger: This data logger can log temperatures for up to eight different thermocouples. Measures from - 270 to +1820°C (-454 to 3308°F). Up to 10 temperature measurements can be taken every second and it has high (20-bit) resolution, which ensures

that the TC-08 can detect minute changes in temperature. For popular Type K thermocouples the TC-08 can maintain a better than 0.025°C resolution over a 250 to +1370°C range. The system supports all popular thermocouple types and is expandable to 20 units / 160 channels.

3.1.2 Test Article

The pipe section dimensions are listed below:

- Diameter: 8.56 in (0.22 m)
- Length: 6.5 in (0.17 m)
- Thickness: 1.06 in (0.027 m)

Fig. 3.5: Grade 91 Steel Pipe Section

3.1.3 Thermocouple Locations

Thermocouples (TCs) were specifically placed in locations that will provide useful data. The locations of the TC's are shown in the drawings below. These locations allowed for the whole data set to be collected to ensure that the heat transfer coefficients could be properly derived through the inverse method.

One TC was attached to the ceramic blanket by wedging it in between the wire running through the loops so that a secure connection was achieved. Figure 3.14 depicting where and how this TC was attached to the ceramic blanket.

One TC was placed very close to the Ceramic heat pad so that a proper surface temperature could be obtained. This thermocouple is placed very close to the heat blanket but not touching it. This will provide an accurate result, rather than placing the thermocouple between the heat blanket and the surface of the steel. By placing the TC in this manner, the data collected will determine the resistance between the two surfaces, the surface of the heat blanket and the surface of the steel pipe. By knowing the resistance between the two surfaces the program will be able to determine the temperature discontinuity of the surfaces. Figure 3.15 depicts the location of this thermocouple.

Three TCs were placed on the side through the thickness of the pipe, shown in figure 3.16. These TC's show the edge effects as the heat is transfered through the steel pipe.

Four TCs were placed on the interior surface of the pipe directly below the top surface thermocouple as seen in figure 3.17. The furthest TC in was the main one used.

One TC was located in the center of the inner diameter of the pipe to measure the air temperature during the heat-treatment process shown in figure 3.18.

One TC was placed on the outer surface of the insulation as shown in figure 3.19 to measure the temperature of the surface of the insulation.

And finally one TC was located a certain distance away from the pipe section to measure the ambient air shown in figure 3.20.

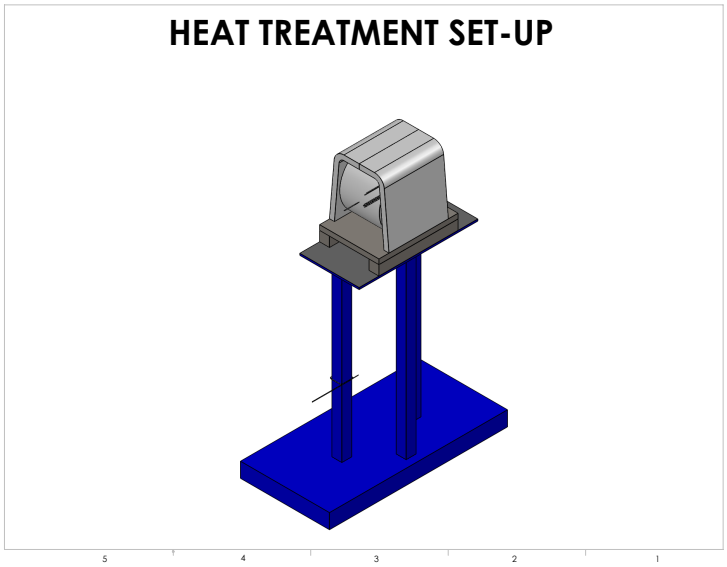


Fig. 3.6: Drawings of Heat-Treatment Set-Up; Page 1

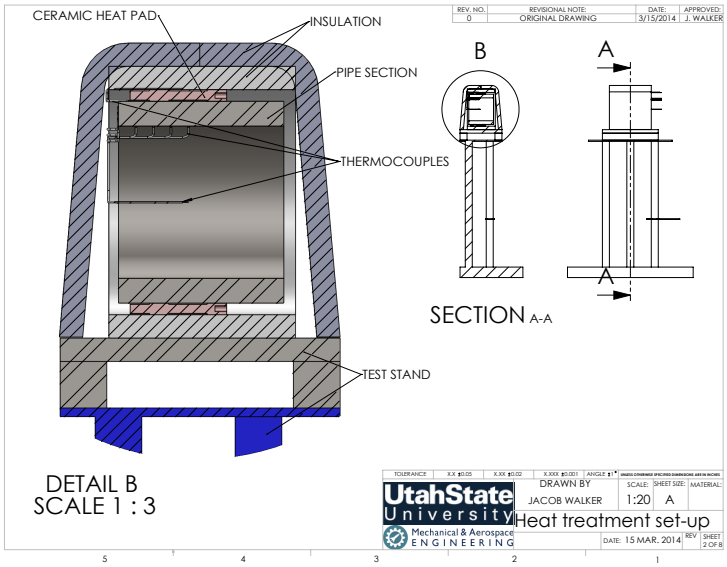


Fig. 3.7: Drawings of Heat-Treatment Set-Up; Page 2

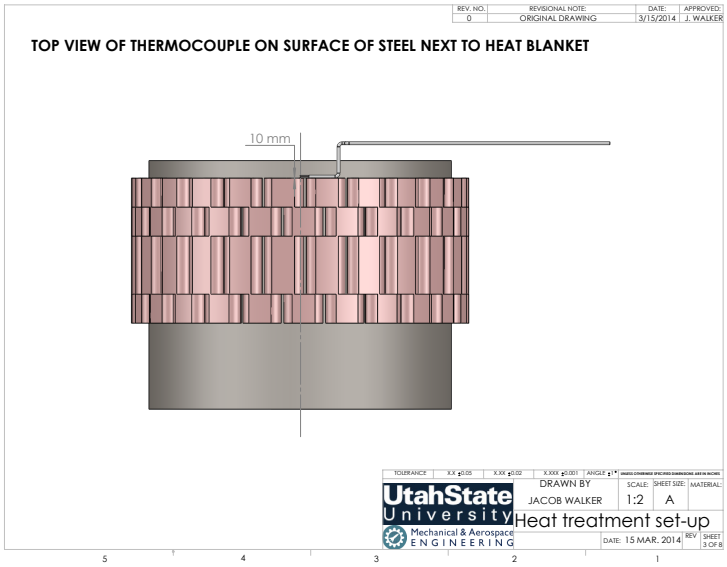


Fig. 3.8: Drawings of Heat-Treatment Set-Up; Page 3

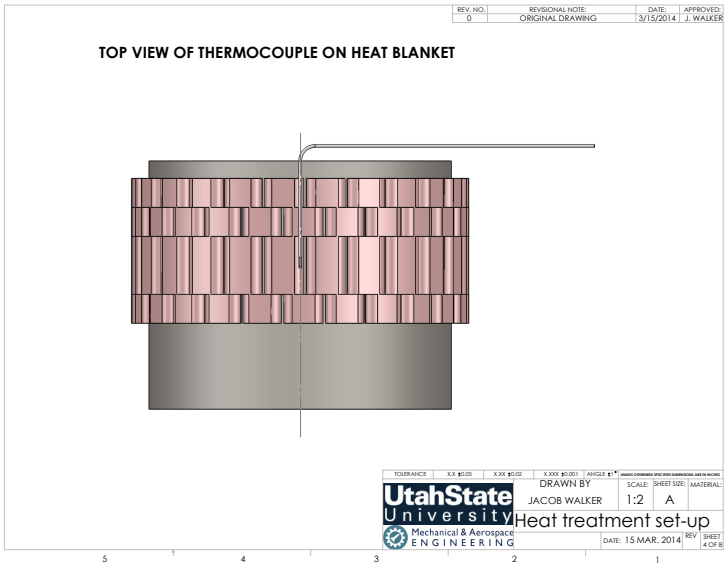


Fig. 3.9: Drawings of Heat-Treatment Set-Up; Page 4

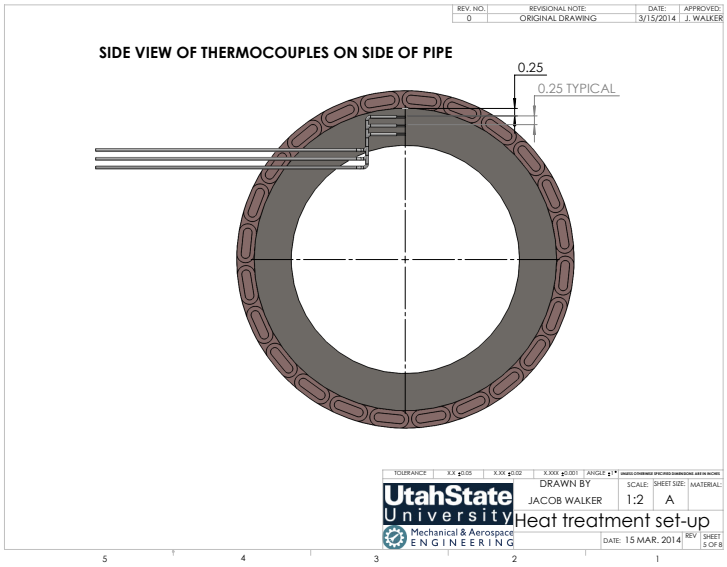


Fig. 3.10: Drawings of Heat-Treatment Set-Up; Page 5

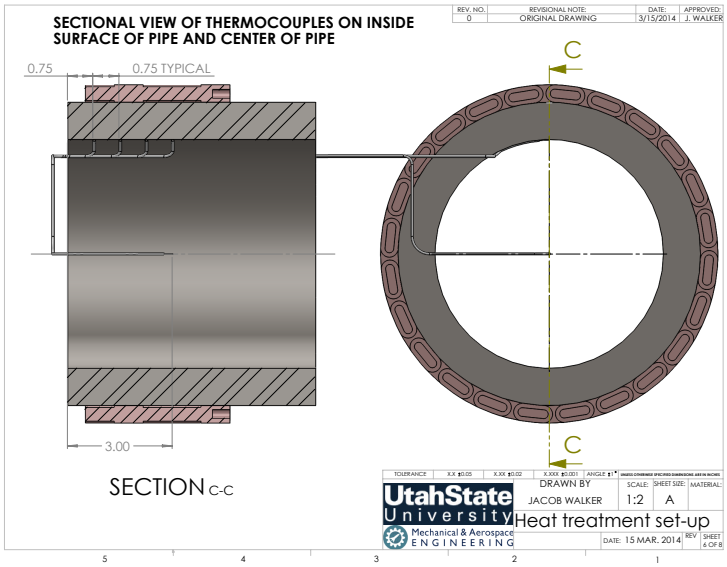


Fig. 3.11: Drawings of Heat-Treatment Set-Up; Page 6

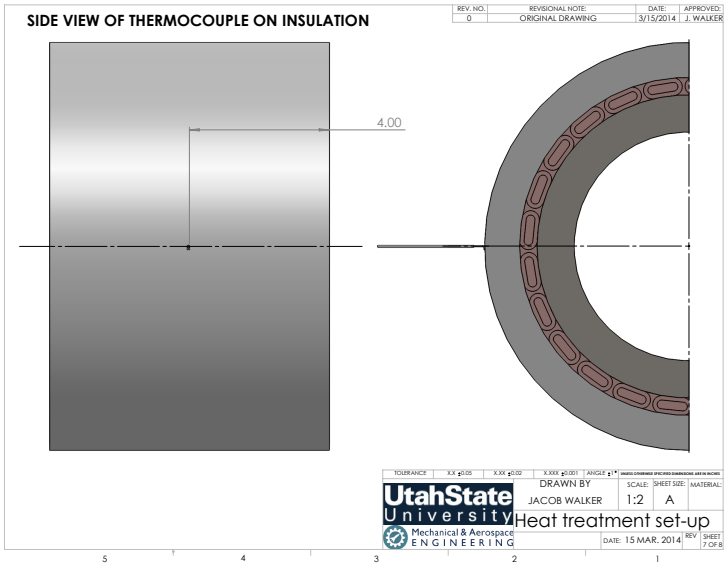


Fig. 3.12: Drawings of Heat-Treatment Set-Up; Page 7

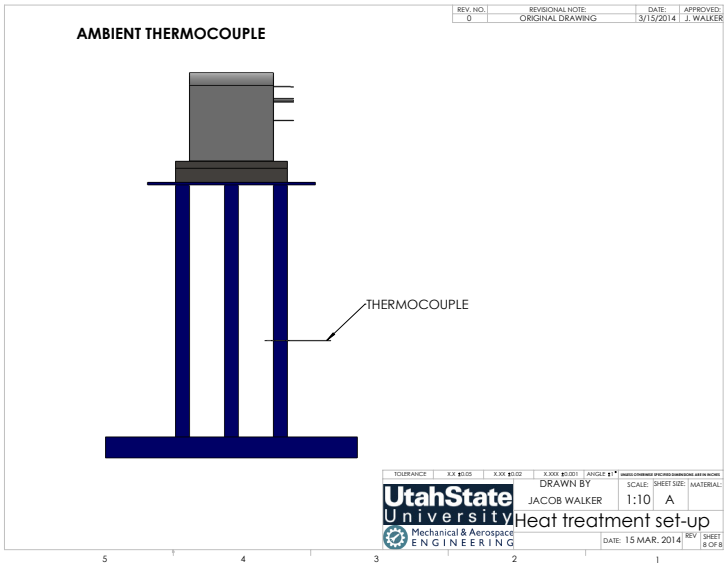


Fig. 3.13: Drawings of Heat-Treatment Set-Up; Page 8

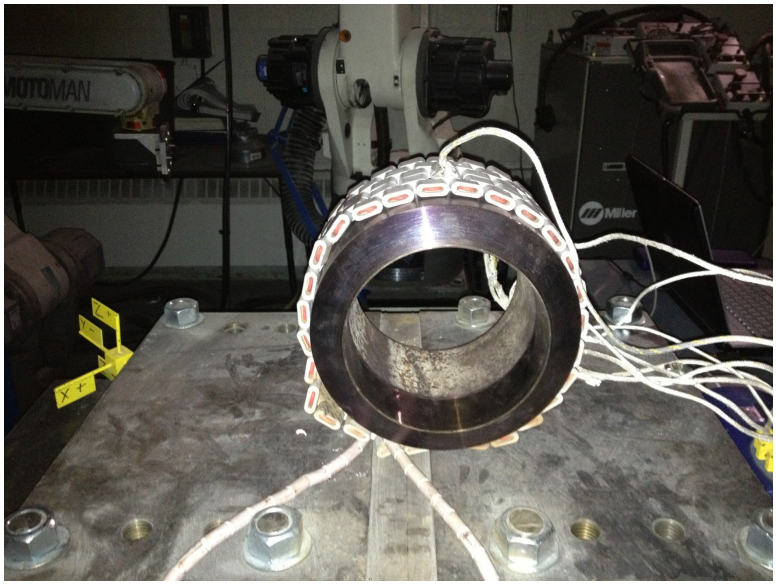


Fig. 3.14: Ceramic Blanket Around Pipe

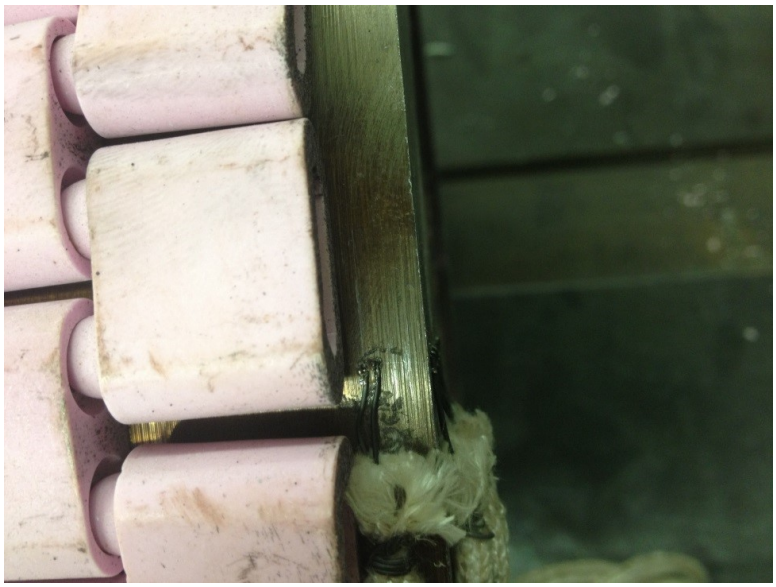


Fig. 3.15: Steel Surface Temperature Next to Blanket Thermocouple

Fig. 3.16: Side Thermocouples

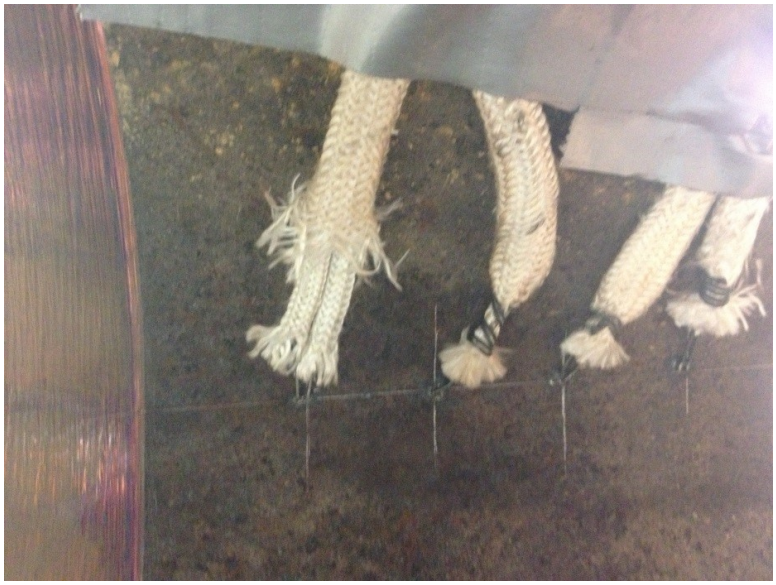


Fig. 3.17: Inside Diameter Surface Temperature Thermocouples

Fig. 3.18: Inside Air Thermocouple

Fig. 3.19: Thermocouple on the Surface of the Insulation

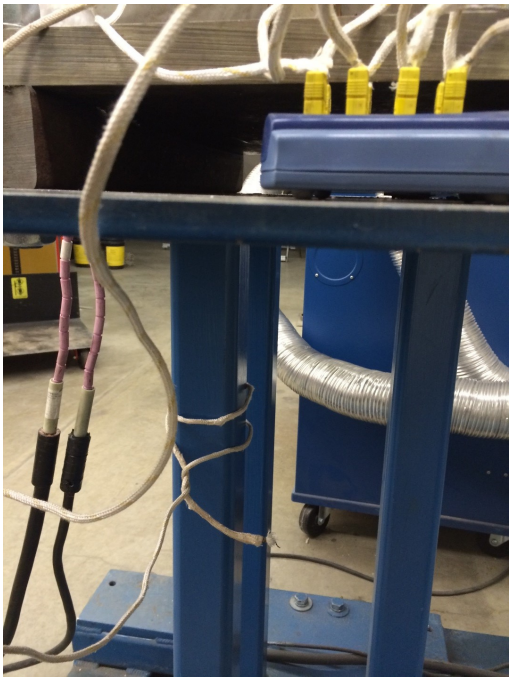


Fig. 3.20: Thermocouple to Measure the Ambient Air Temperature

Fig. 3.21: Final Experimental Setup

Each of these TCs provide all of the data necessary to calculate the desired unknowns. Figure 3.21 is a depiction of the experimental set-up including the locations of the thermocouples the location of the heat blanket. Figure 3.21 also shows how the insulation blanket encapsulates the entirety of the pipe section.

3.1.4 Temperature Profiles

To adequately determine the proper unknown heat transfer coefficients various temperatures need to be run to define how temperature affects the heat transfer coefficients. Multiple runs at each target heat point defined below will be run to ensure statistical stability. The temperature ranges are as follows:

- 1400°F (760°C)
- 1200°F (648.89°C)
- 1000°F (537.78°C)
- 800°F (426.67°C)

Each of these temperature points will be ran for a lengthy period of time to ensure that steady state is achieved and the pipe reaches a uniform temperature.

3.1.5 Equations

The inverse method will be used to calculate the unknown heat transfer coefficients. This is done by using the fundamental heat transfer equations defined below:

Heat Flux Through the Outside of the Insulation:

$$q_i" = \frac{k_i(T_{s,1} - T_{s,2})}{r_2 ln(r_2/r_1)} \tag{3.1}$$

The thermal conductivity of the insulation *(k_i)* varied with temperature. Therefore, the assumption was made to use linear interpolation for temperatures between the provided data. Values of k_i varied from 0.44 (W/mK) @ 500°F (260°C) and below up to 2.83

(W/mK) @ 2000°F (1093°C). The thickness *(L)* of the thermal insulation was 1 in (0.0254 m). Another assumption made was that the temperature of the insulation closest to the heat blanket *($T_{s,1}$)* was equal in temperature to that of the heat blanket. Finally the temperature on the outside of the insulation *($T_{s,2}$)* was measured by an attached thermocouple.

Convection Coefficient off of the Surface of the Insulation:

$$h_i = \frac{q_i"}{(T_{s,2} - T_\infty)} \tag{3.2}$$

The heat flux $q_i"$ that was calculated from the previous equation is used in this equation. Both the temperature of the insulation surface *($T_{s,2}$)* and the temperature of the ambient air *(T_∞)* were collected by thermocouples.

Heat Flux at the Outside and Inside Surfaces of the Steel Pipe:

$$q_{s,o}" = \frac{k_s(T_{s,2} - T_{s,1})}{r_2 ln(r_2/r_1)} \tag{3.3}$$

$$q_{s,i}" = \frac{k_s(T_{s,2} - T_{s,1})}{r_1 ln(r_2/r_1)} \tag{3.4}$$

An assumption was made that the thermal conductivity of the steel *(k_s)* does not vary substantially with temperature and is 33 (W/mK). Both the temperature of the steel top surface *($T_{s,2}$)*, the surface closest to the heat blanket, and the temperature of the steel surface on the inside pipe wall *($T_{s,1}$)* were collected by thermocouples. The variables r_1 and r_2 are the inner radius and outer radius of the pipe respectively.

Convection Coefficient off of the Inside Surface of the Steel Pipe:

$$h_s = \frac{q_{s,i}"}{(T_{s,1} - T_{s,\infty})} \tag{3.5}$$

The heat flux at the inside surface of the steel pipe $q_{s,i}$" is used in this equation. Both the temperature of the steel inside pipe surface $(T_{s,1})$ and the temperature of the air inside the pipe $(T_{s,\infty})$ were collected by thermocouples.

Thermal Contact Resistance Between the Thermal Blanket and the Insulation:

$$R_t, c" = \frac{T_A - T_B}{q_o"} \tag{3.6}$$

The heat flux calculated at the surface of the steel pipe q_o" was used in this equation. Temperatures of the heat blanket (T_A) and the steel surface (T_B) were measured by thermocouples.

The data collected from each of the runs will be inserted into each of these equations and the coefficients will be back calculated. The inverse method will compute a heat transfer coefficient at the outer surface of the insulation and at the center of the pipe as well as the resistance between the heat blanket and the steel pipe. These heat transfer coefficients will take into account the effects of heat transfer for the system. This method will provide a good assumption for the effects of each of these forms of heat transfer and can be used in the forward calculations to determine unknown heat transfer profiles.

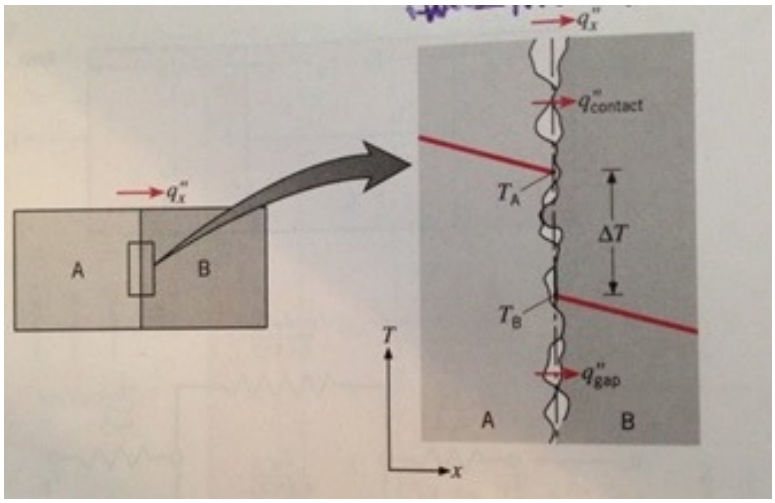


Fig. 3.22: Temperature Drop Due to Thermal Resistance [15]

CHAPTER 4
DATA COLLECTION

4.1 Temperature Profiles

In order to collect adequate data for a wide variation of temperatures possible used for heat treatments, multiple data runs were done at specific temperatures. Heat treatment runs were run for lengthy periods of time in order to achieve as close to steady state temperatures as possible. Temperature collection by the data acquisition system was taken every minute. Calculated coefficients are compared at each of the varying temperatures. The targeted temperature profiles are as follows:

- 1400°F (760°C)
- 1200°F (648.89°C)
- 1000°F (537.78°C)
- 800°F (426.67°C)

These temperature runs were done and the temperature vs. time traces can be seen in the following figures.

4.1.1 800°F Temperature Run

Run 1 seen in figure 4.1 initially overshot the temperature because the heat was turned up very high before adjusting to achieve the proper temperature range. Following run 1, runs 2, 3, and 4 were executed with no issues. The final settings on the TIG welder (heat source) were 37.8 volts and 20 amps.

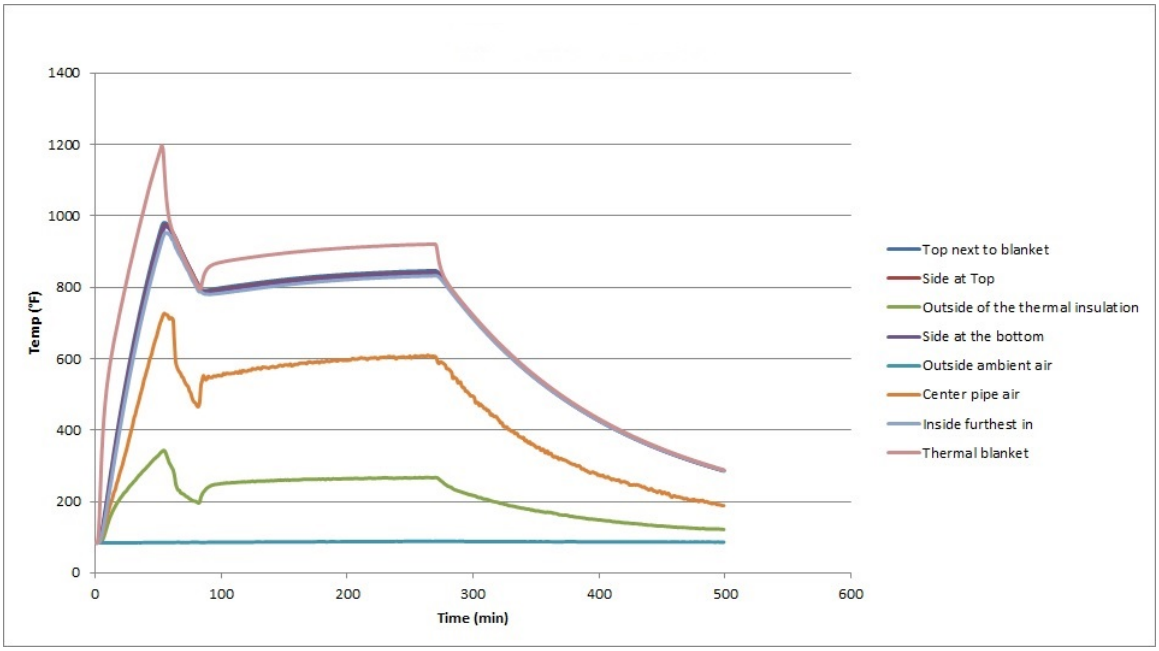


Fig. 4.1: First Run at 800°F

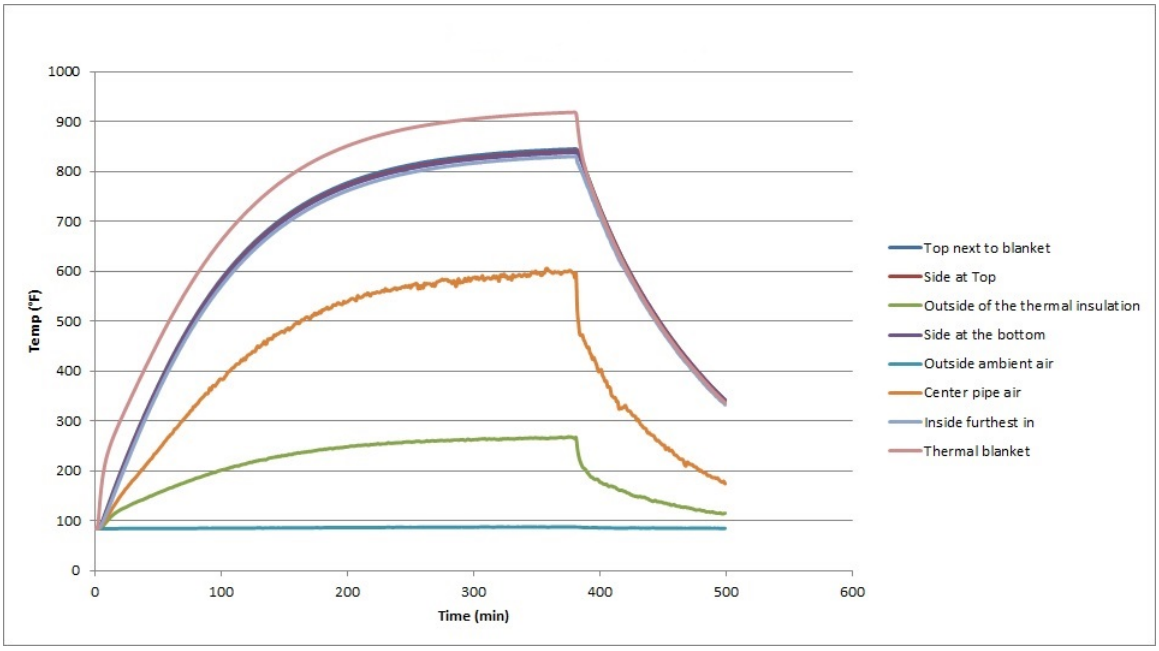


Fig. 4.2: Second Run at 800F

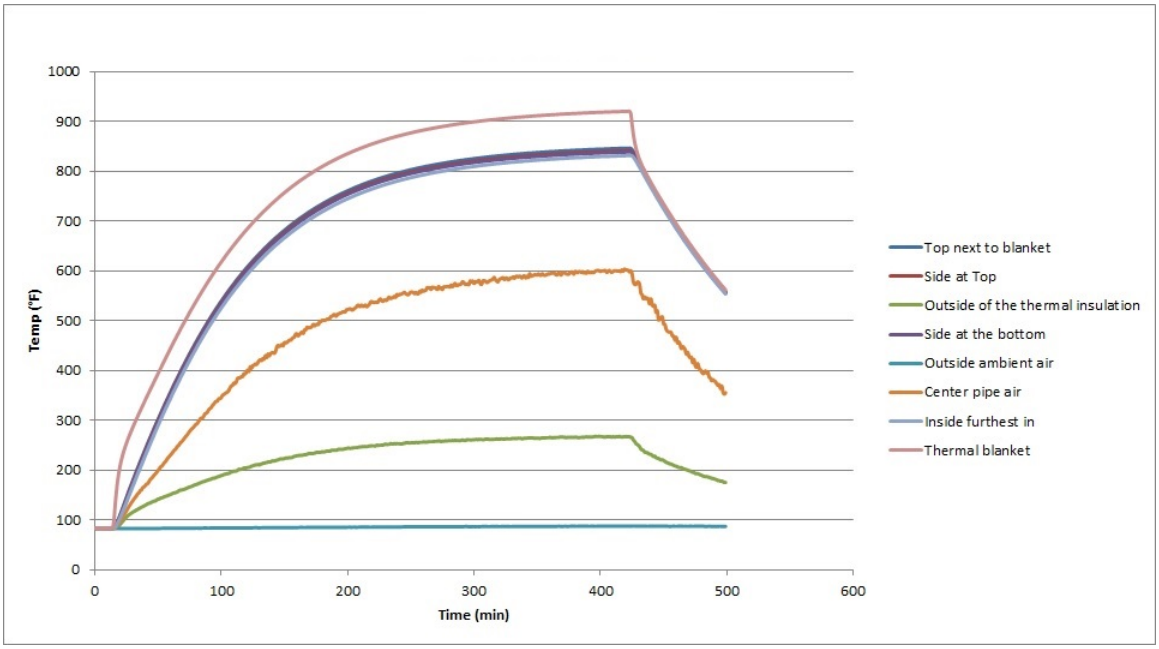


Fig. 4.3: Third Run at 800°F

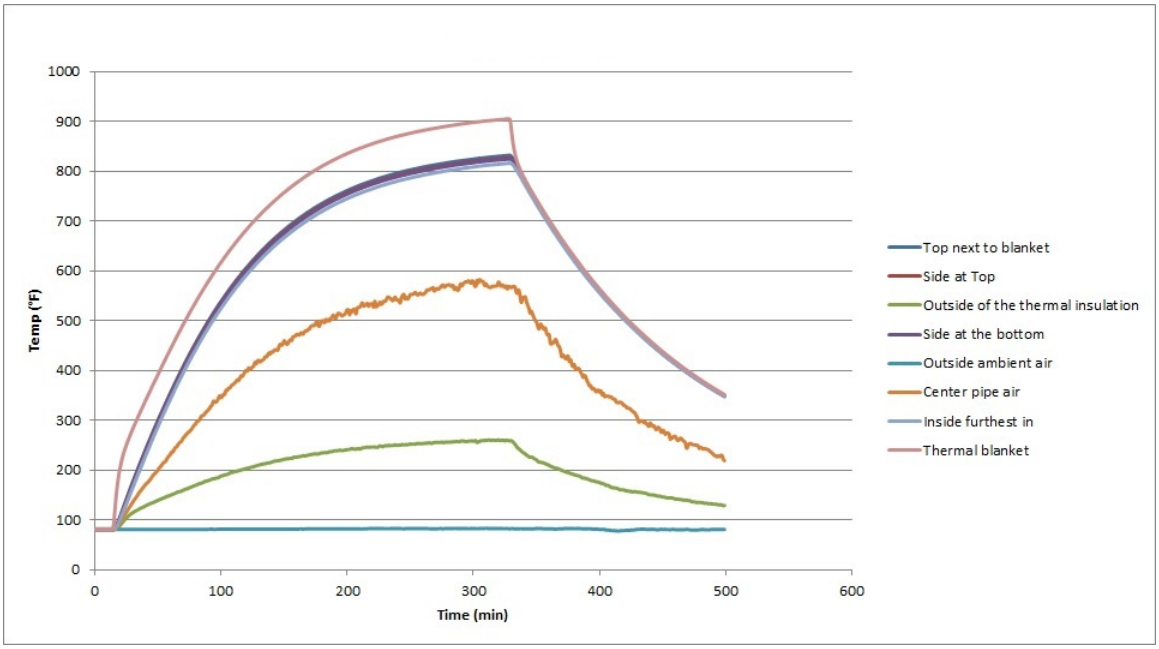


Fig. 4.4: Fourth Run at 800°F

4.1.2 1000°F Temperature Run

Run 1 seen in figure 4.5 initially overshot the temperature because the heat was turned up too high before adjusting to achieve the proper temperature range. Following run 1, runs 2, 3, and 4 were executed with no issues. The final settings on the TIG welder (heat source) were 47.2 volts and 25 amps.

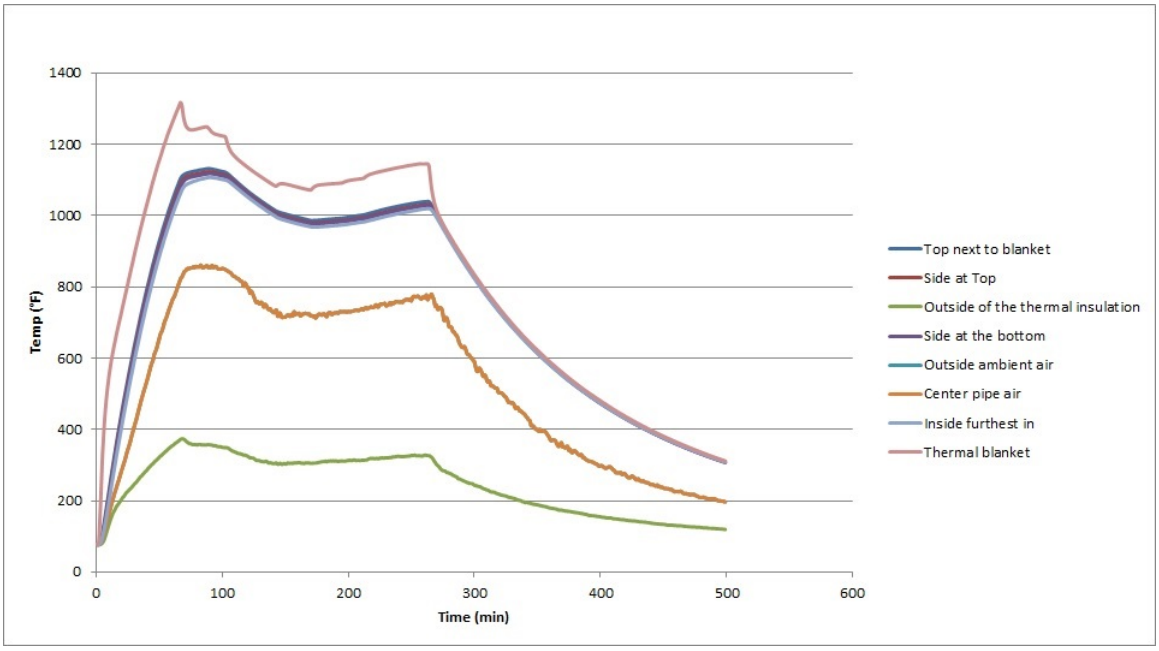


Fig. 4.5: First Run at 1000°F

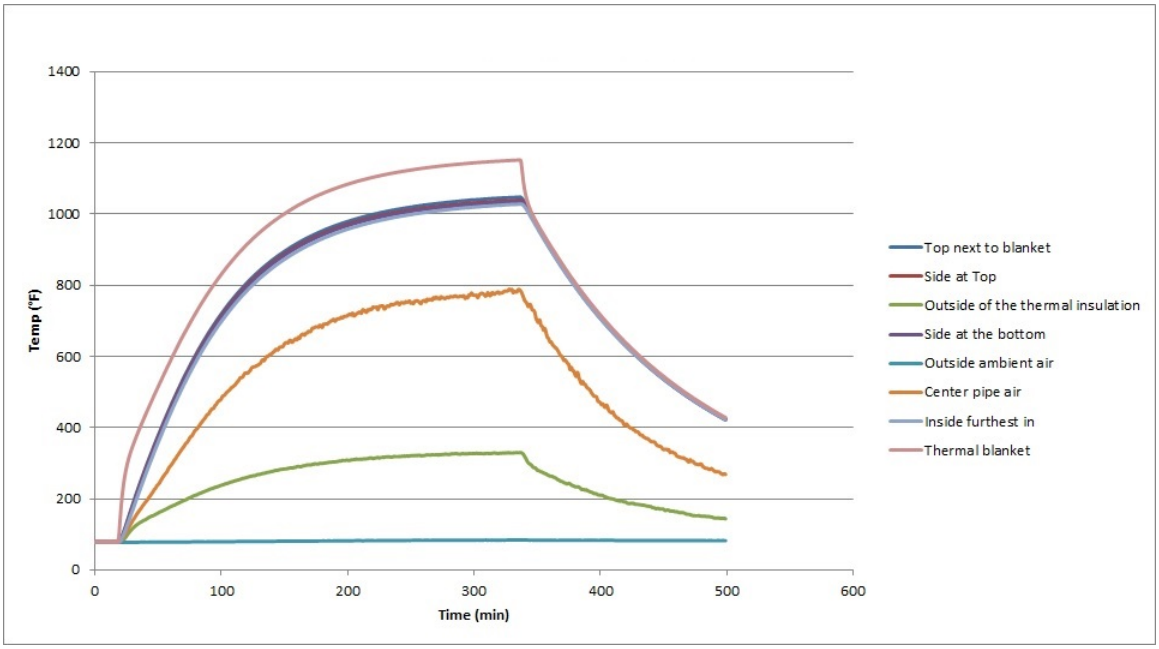


Fig. 4.6: Second Run at 1000°F

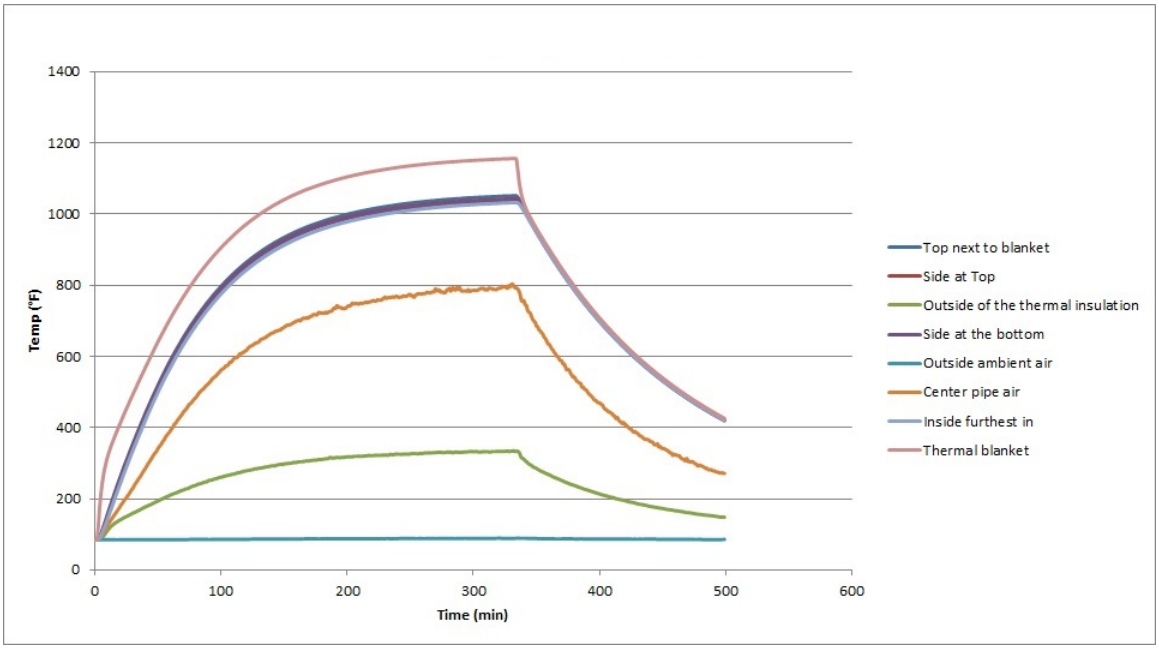


Fig. 4.7: Third Run at 1000°F

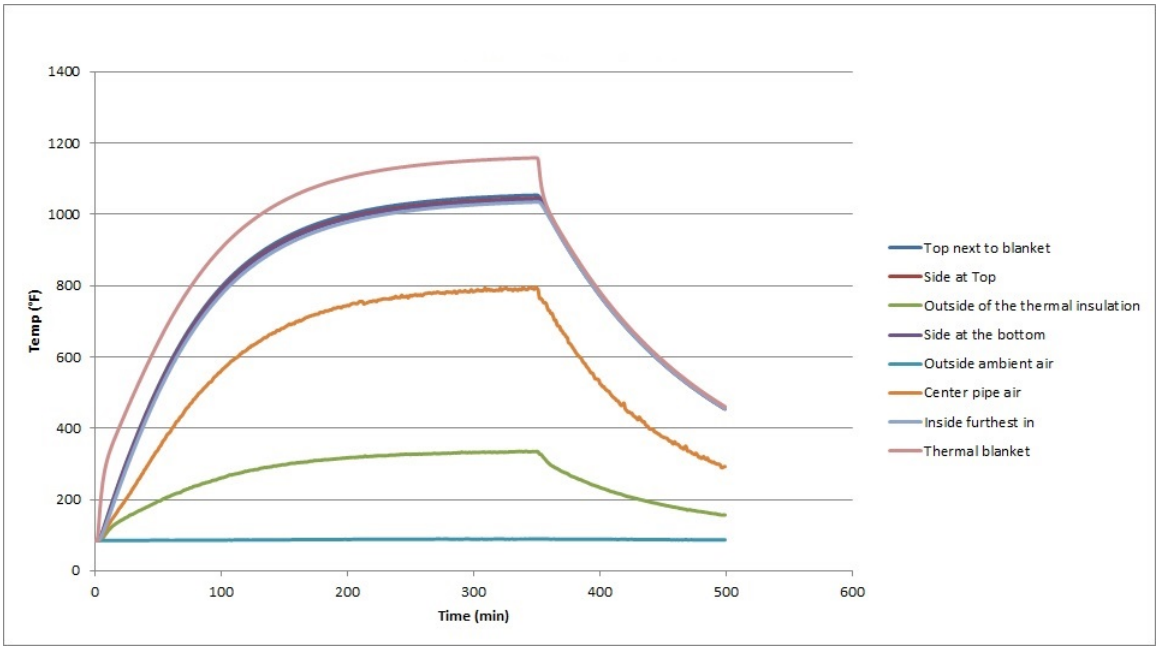


Fig. 4.8: Fourth Run at 1000°F

4.1.3 1200°F Temperature Run

Run 1 seen in figure 4.9 initially overshot the temperature because the heat was turned up too high and the temperature reach slightly above the max range. Run 2 seen in figure 4.10 undershot the temperature and was slightly below the minimum desired temperature; finally, the temperature was adjusted to the correct temperature range seen in figures 4.11, 4.12, and 4.13. The final settings on the TIG welder (heat source) were 69.5 volts and 32 amps.

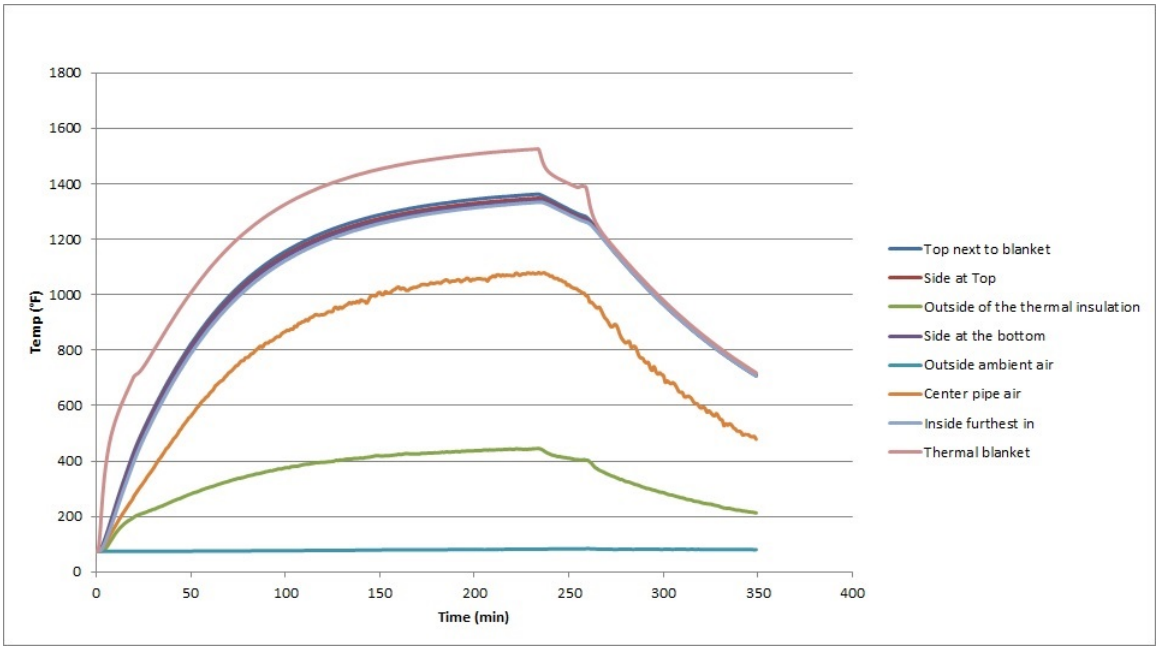


Fig. 4.9: First Run at 1200°F

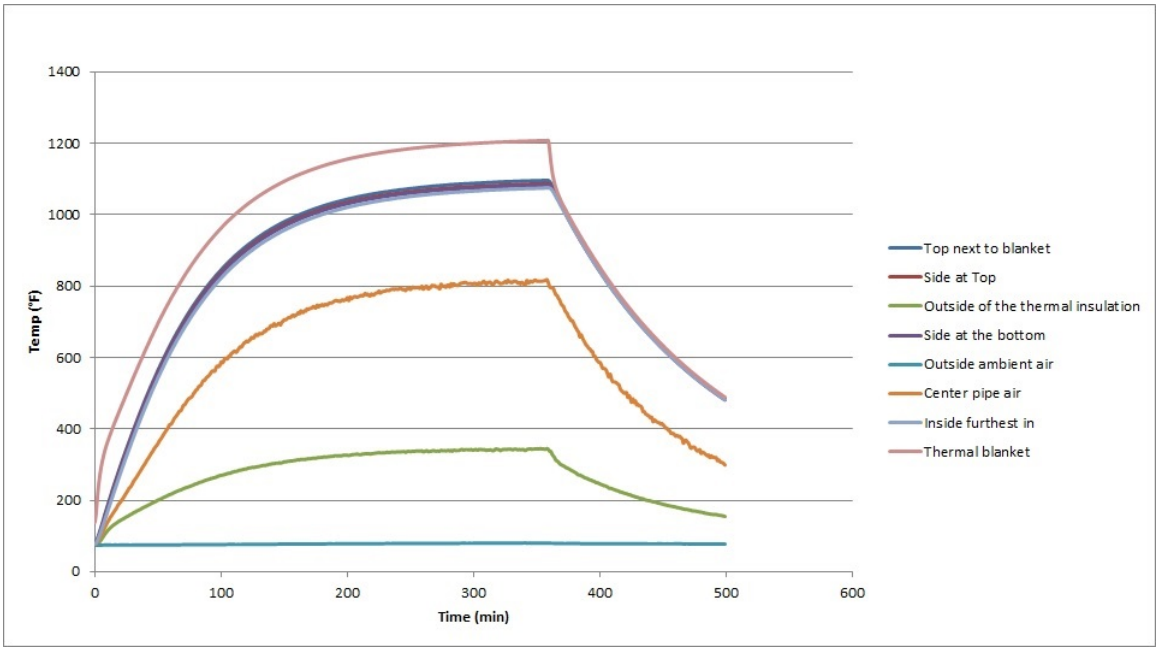


Fig. 4.10: Second Run at 1200°F

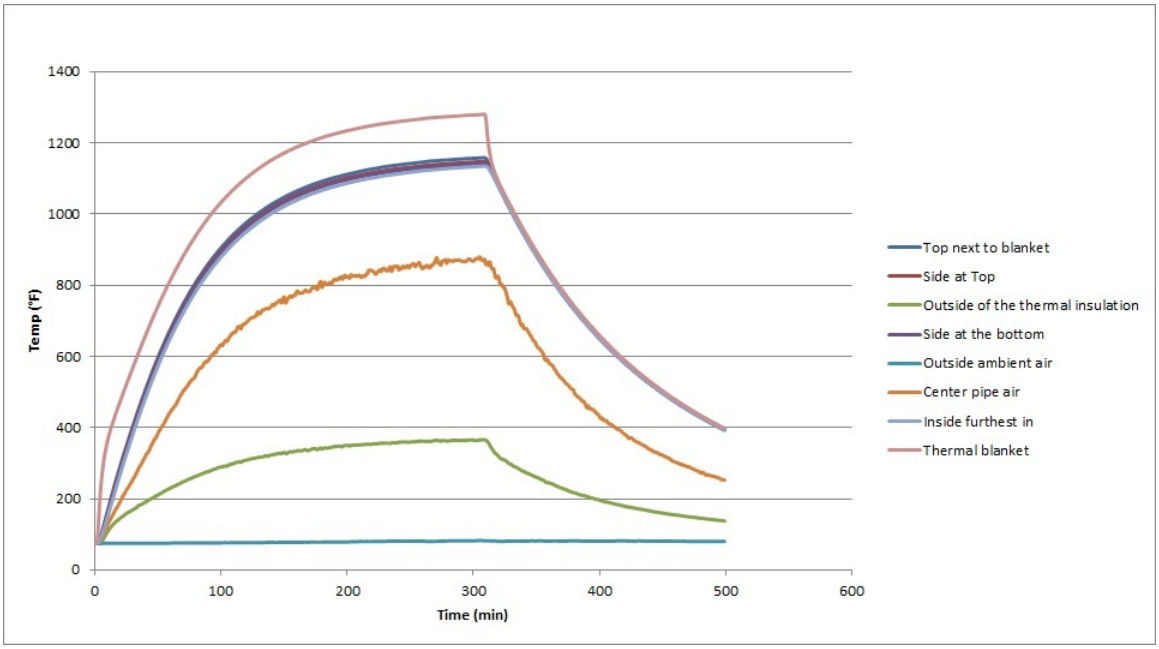


Fig. 4.11: Third Run at 1200°F

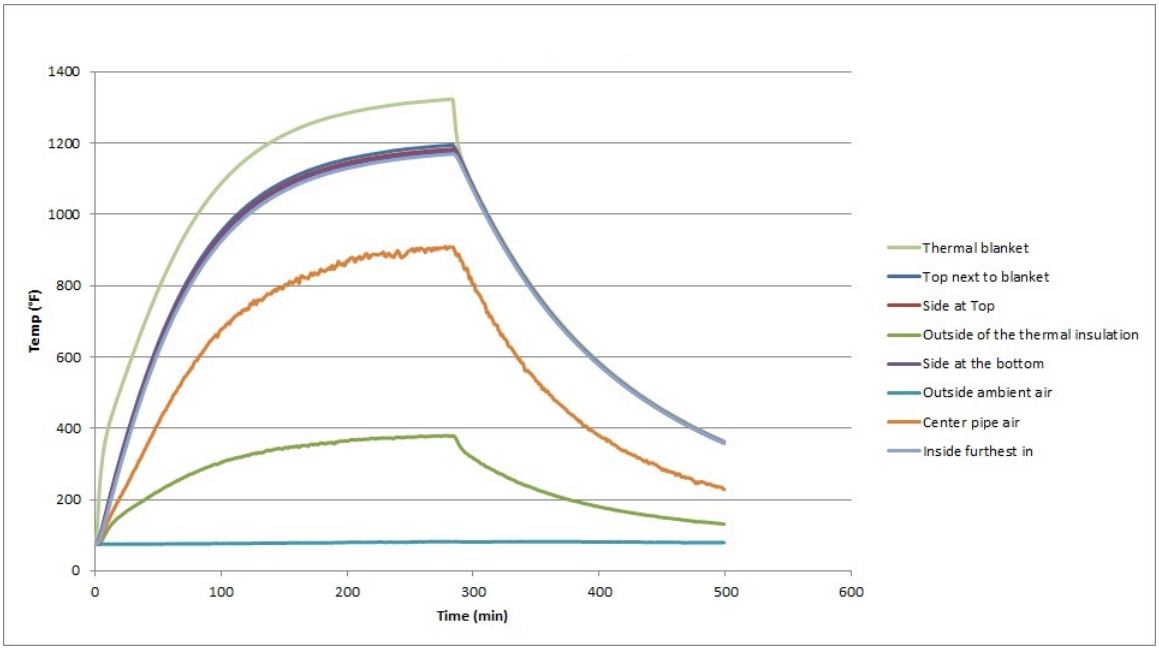


Fig. 4.12: Fourth Run at 1200°F

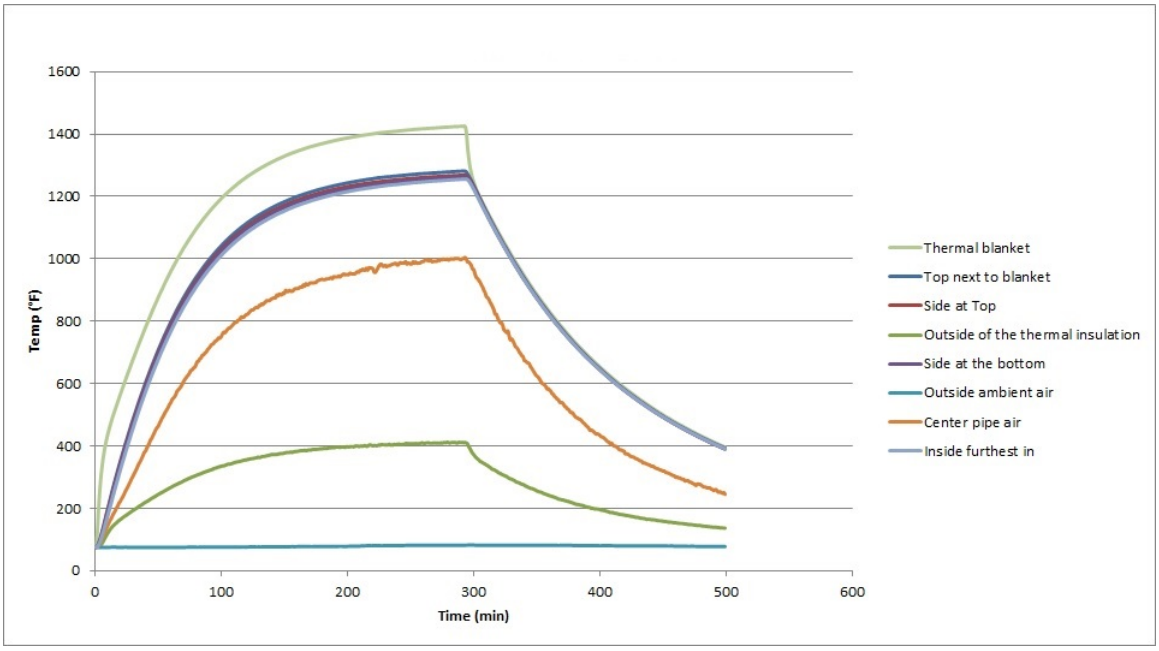


Fig. 4.13: Fifth Run at 1200°F

4.1.4 1400°F Temperature Run

The temperature was initially adjusted in the correct range therefore only three trials were ran. The final settings on the TIG welder (heat source) were 75 volts and 41 amps (max setting).

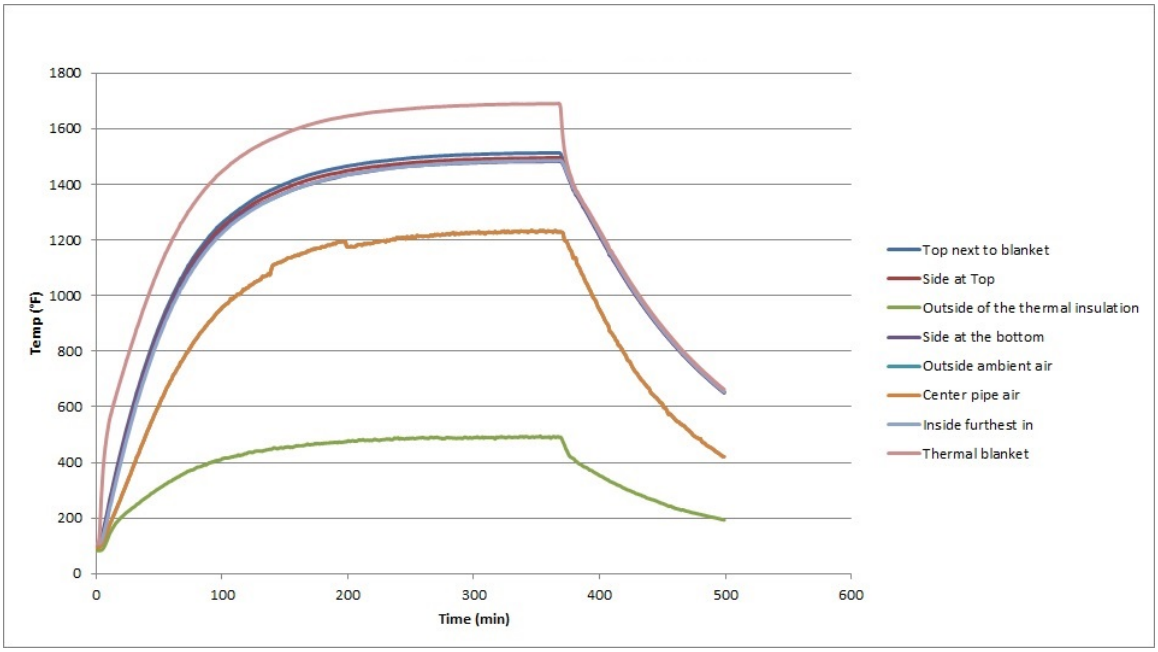


Fig. 4.14: First Run at 1400°F

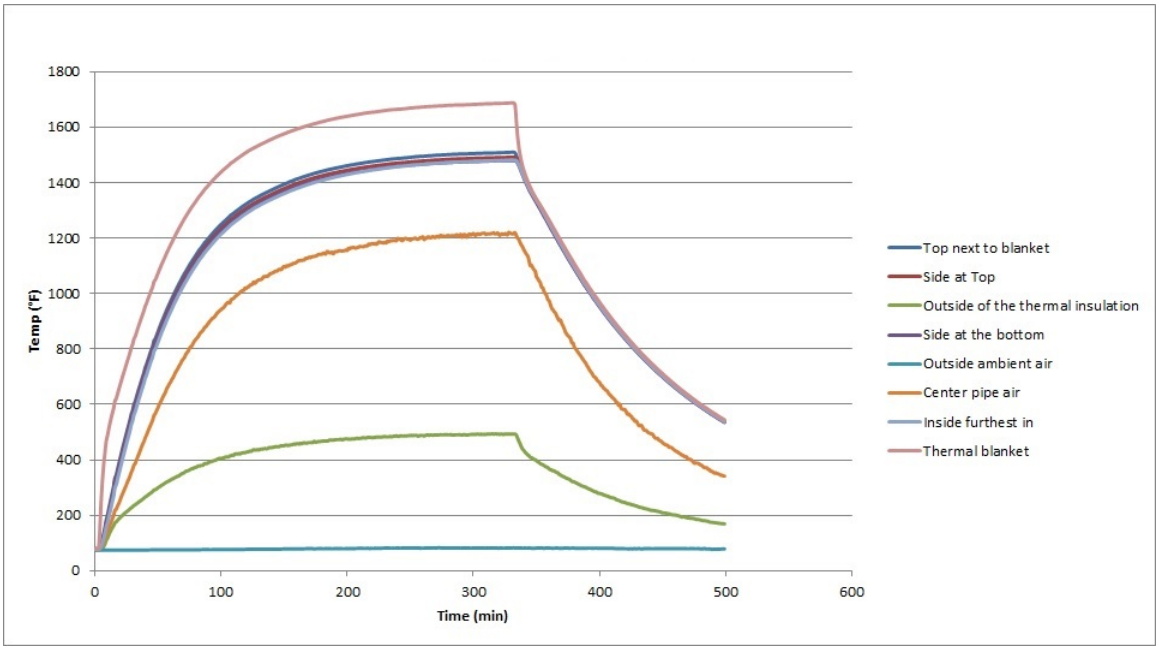


Fig. 4.15: Second Run at 1400°F

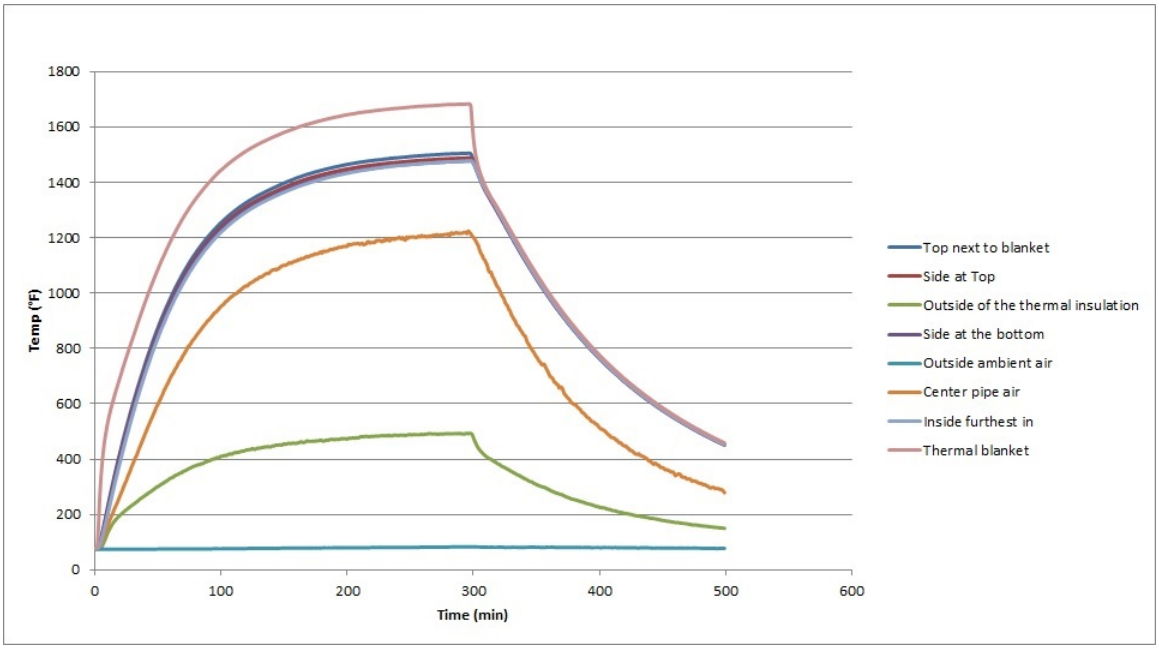


Fig. 4.16: Third Run at 1400°F

The temperature data runs collected adequate data to calculate the unknown heat transfer coefficients. Each of the heat-treatment runs were ran for lengthy periods of time in order to achieve as close to steady state temperatures as possible. These factors will provide results that are statistically sound.

CHAPTER 5

RESULTS AND DISCUSSION

The temperature graphs were used to calculate the heat flux through the insulation and the steel. The calculated heat fluxes were then used to calculate the resistance between the ceramic blanket and the convection coefficients off each of the surfaces, i.e. the surface of the insulation and the surface of the inside of the pipe. The following figures are the graphs for each value calculated.

5.1 Flux at the Outside Surface of the Insulation

For 800°F and 1000°F temperature runs seen in figures 5.1 and 5.2 , run 1 for each of these has a large spike at the in the initial transient stage. This phenomenon is due to the machine voltage turned up higher to achieve a high heat rate. The temperature was then turned down to achieve the appropriate temperature. After run 1 the rest of the data was collected without changing the controls on the machine. As can be seen from the following figures the maximum heat flux through the insulation varied from 1,000 to 4,000 W/m^2. Naturally, as the temperature of the pipe increased more heat flux through the insulation was observed, as expected. One thing to note is the temperature was slightly changed for each run in the 1200°F, which is why there are differences in the maximums.

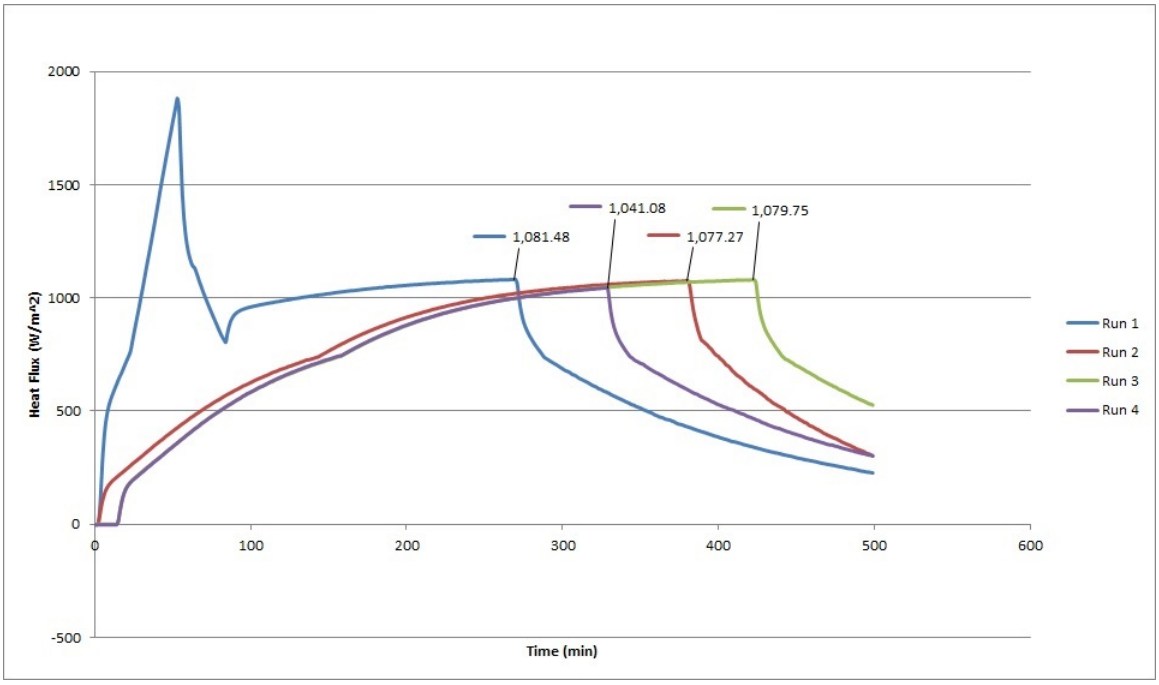


Fig. 5.1: Flux Outside of Insulation 800°F

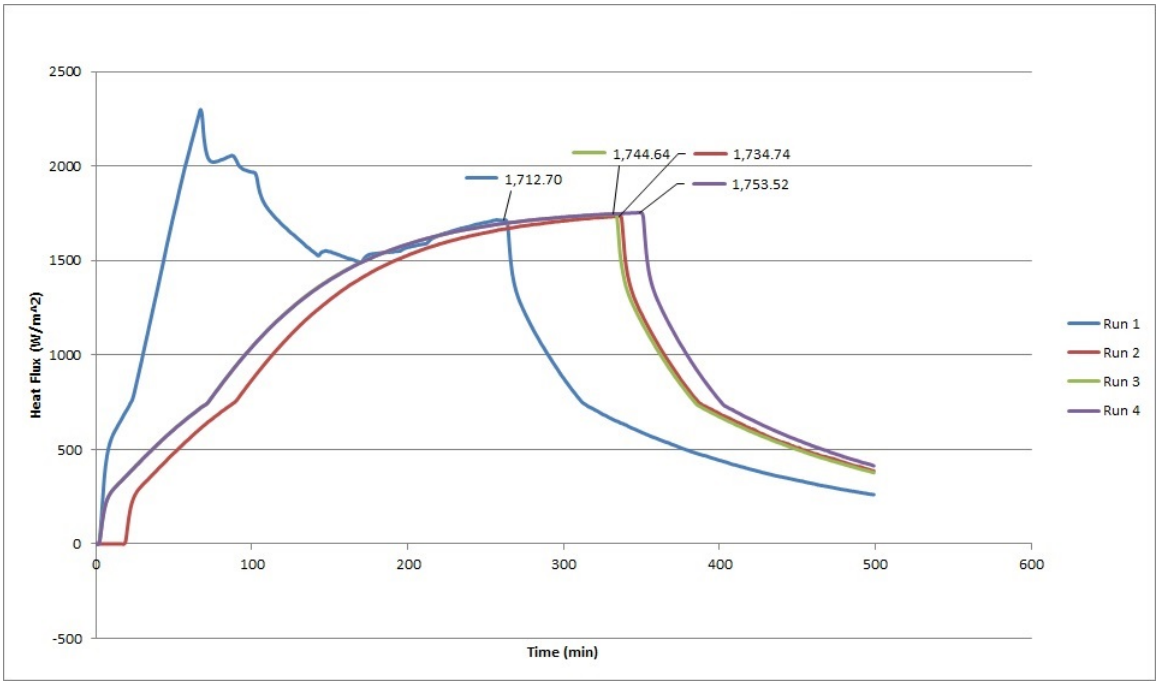


Fig. 5.2: Flux Outside of Insulation 1000°F

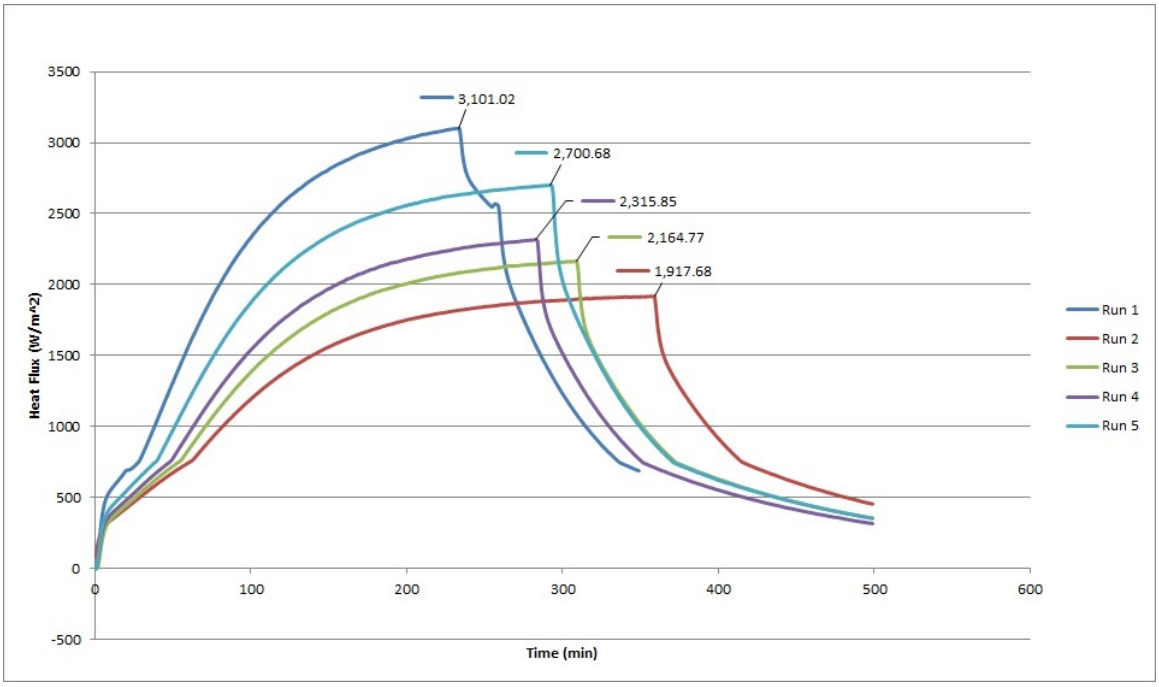


Fig. 5.3: Flux Outside of Insulation 1200°F

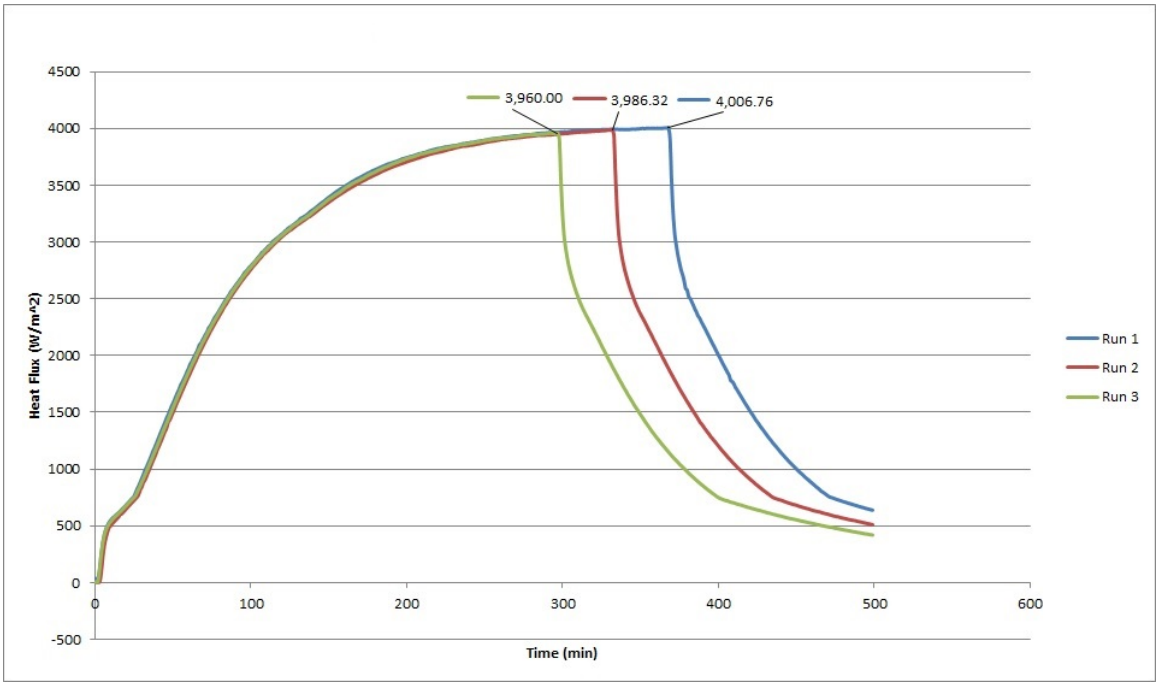


Fig. 5.4: Flux Outside of Insulation 1400°F

5.2 Convection Coefficient at the Outside Surface of the Insulation

As was discussed in the last data set, run 1 shows some inconsistencies in the data due to temperature adjustments. The initial start-up of the test results in some noise. As can be seen from the figures the maximum heat transfer coefficient off the surface of the insulation varied from 10 to 18 W/m^{2}K. Typical Values of the convection heat transfer coefficient for gases under free convection are in the range of 2-25 (W/m^{2}K) [15]. The final stage of run two also showed some abnormalities. Referring back to the temperature traces of data collected shows that there was a more rapid initial cooling than was typically observed on other trials. The cause of the more rapid cooling is unknown; however, the data does point towards some difference with this particular run upon the cool down region.

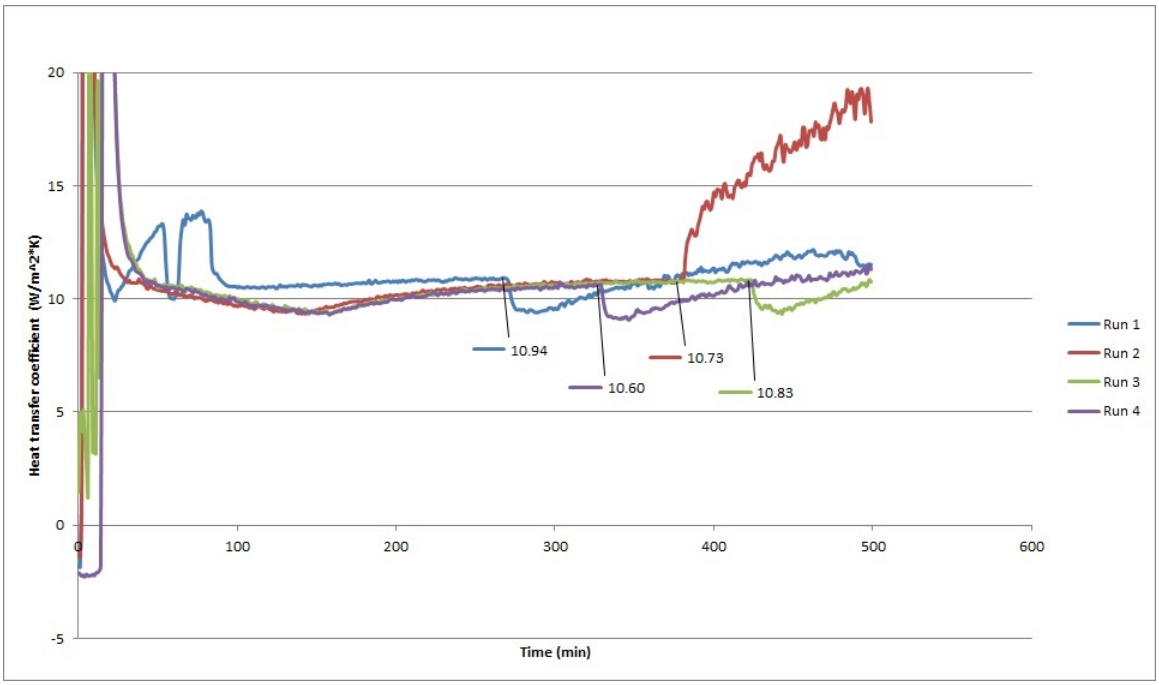


Fig. 5.5: Convection Coefficient off the Insulation 800°F

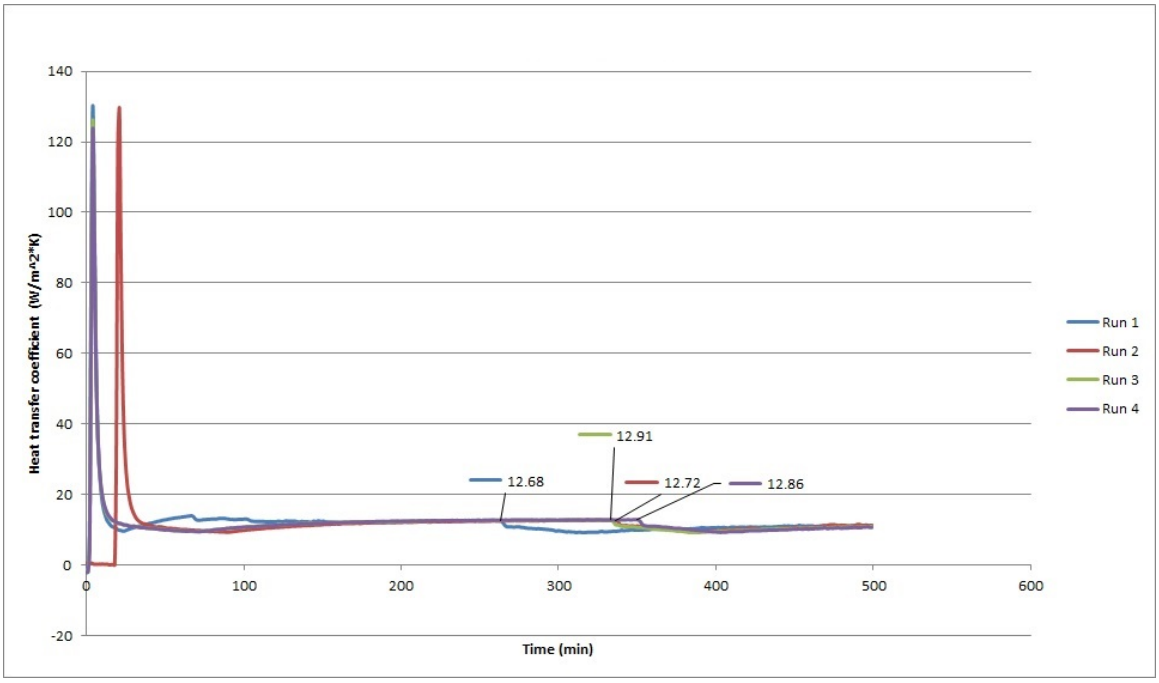


Fig. 5.6: Convection Coefficient off the Insulation 1000°F

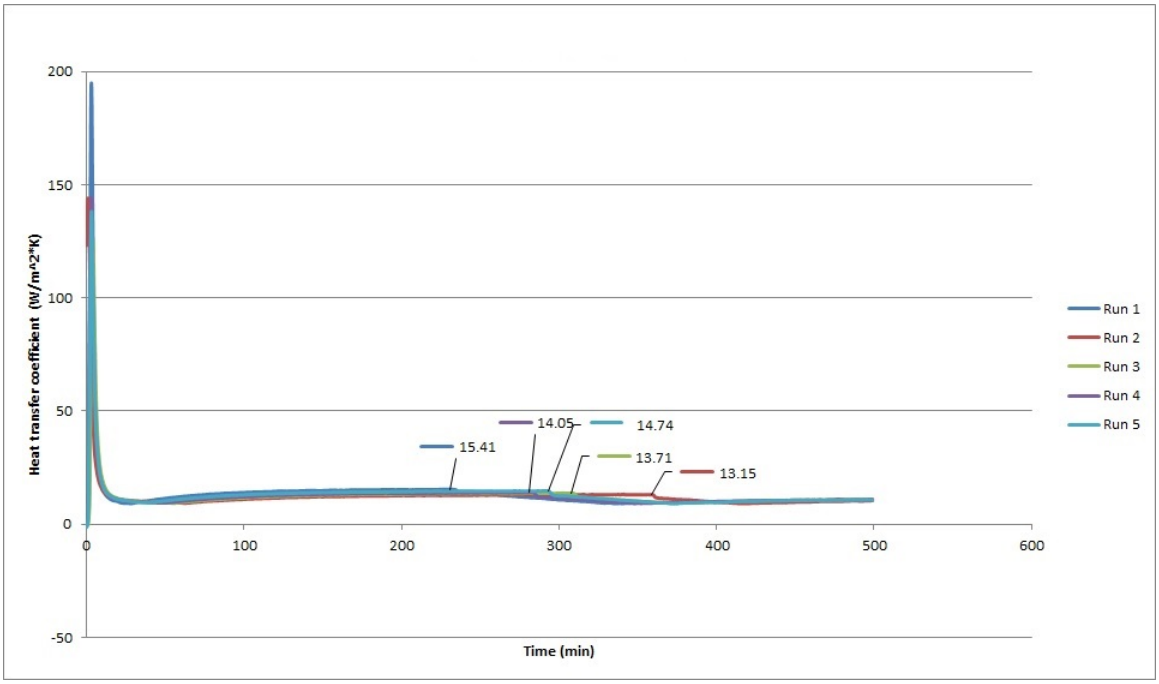


Fig. 5.7: Convection Coefficient off the Insulation 1200°F

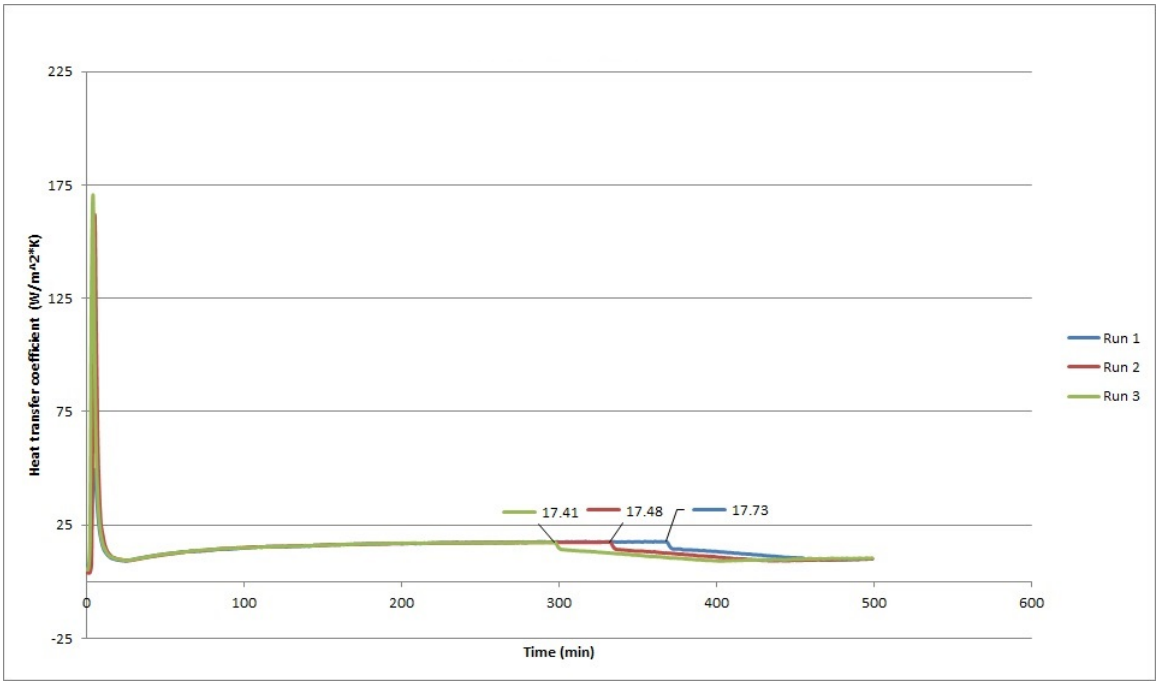


Fig. 5.8: Convection Coefficient off the Insulation 1400°F

5.3 Flux at the Outside Surface of the Steel Pipe

For 800°F and 1000°F temperature runs, run 1 for each of these has a large spike at the in the initial transient stage. This phenomenon is due to the machine voltage turned high to achieve a high heat rate. The temperature was then turned down to achieve the appropriate temperature. After run 1 for these two cases, the rest of the data was collected without changing the controls on the machine. As can be seen from the figures the maximum heat flux through the insulation varied from 8,500 to 16,600 W/m^2. Naturally, as the temperature of the pipe increased more heat flux through the insulation was observed as was expected. One thing to note is the temperature was slightly changed for each run in the 1200°F, which is why there are differences in the maximums.

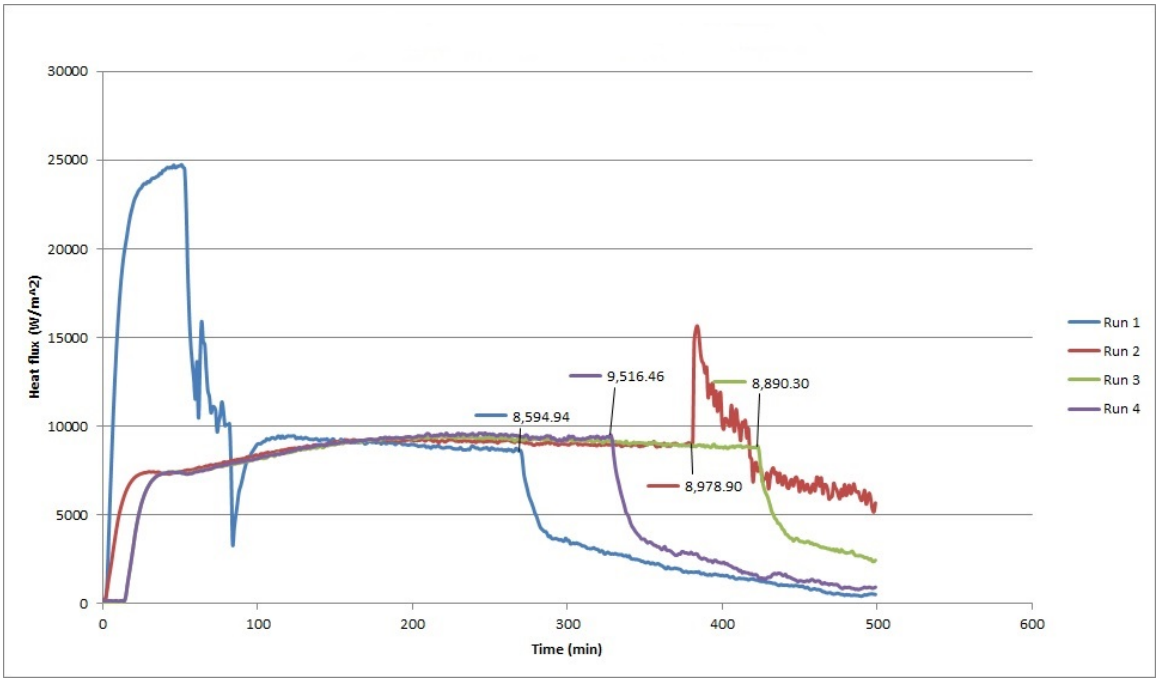


Fig. 5.9: Flux Outside Surface of Steel Pipe 800°F

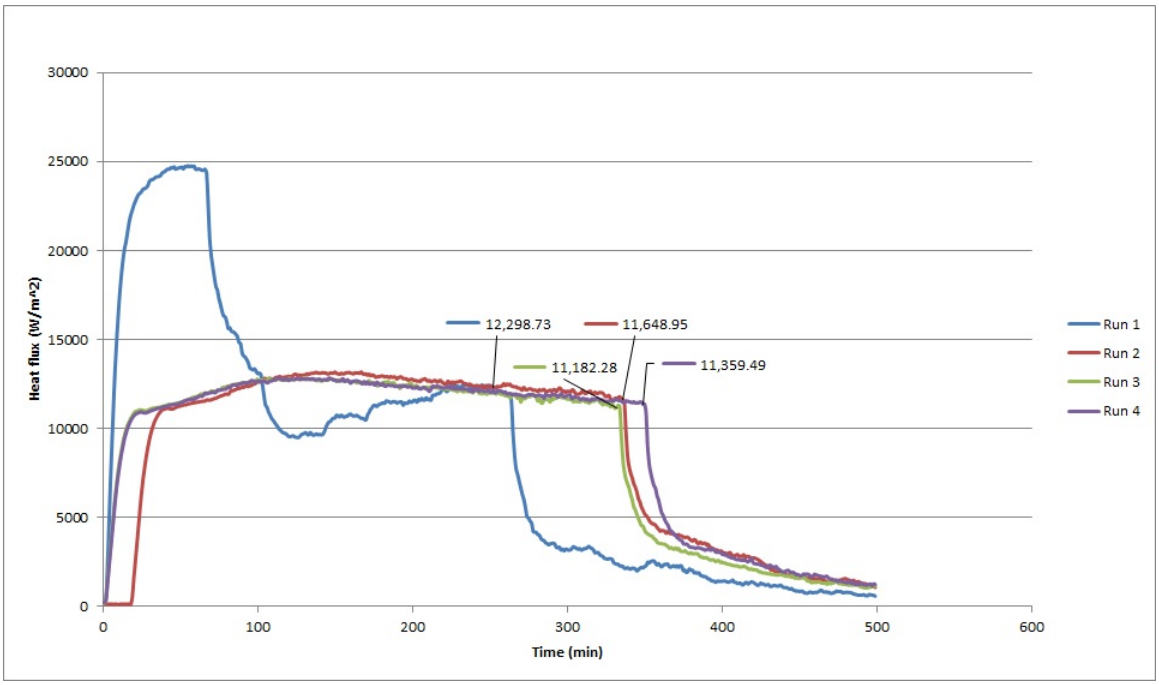


Fig. 5.10: Flux Outside Surface of Steel Pipe 1000°F

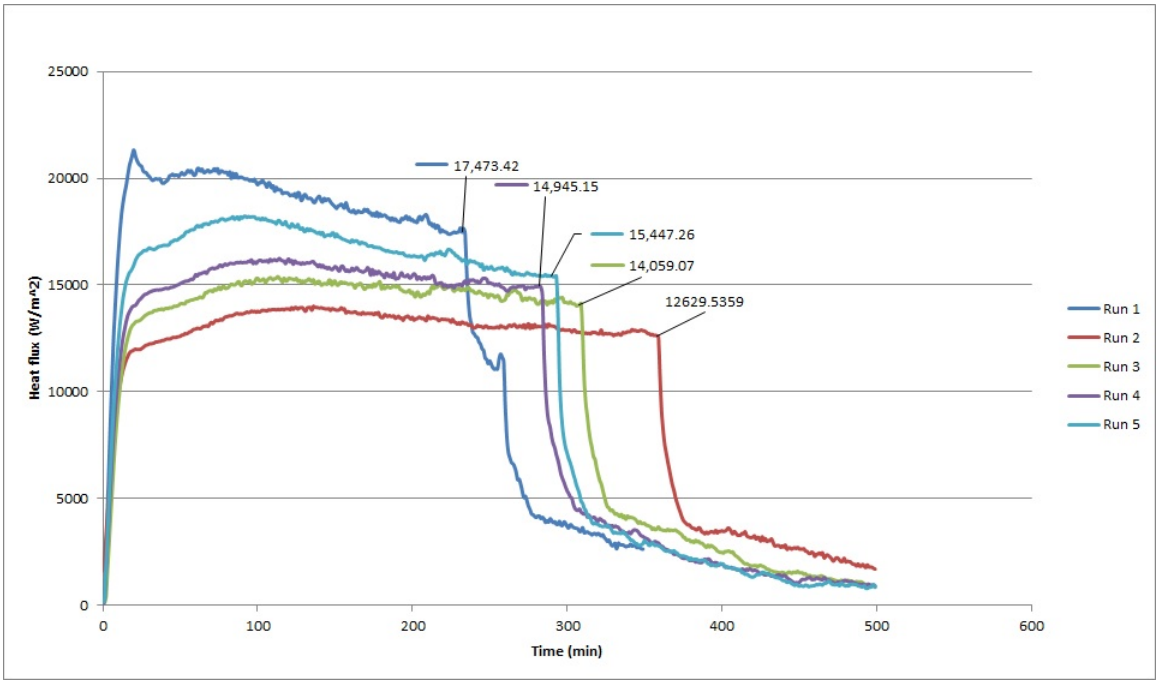


Fig. 5.11: Flux Outside Surface of Steel Pipe 1200°F

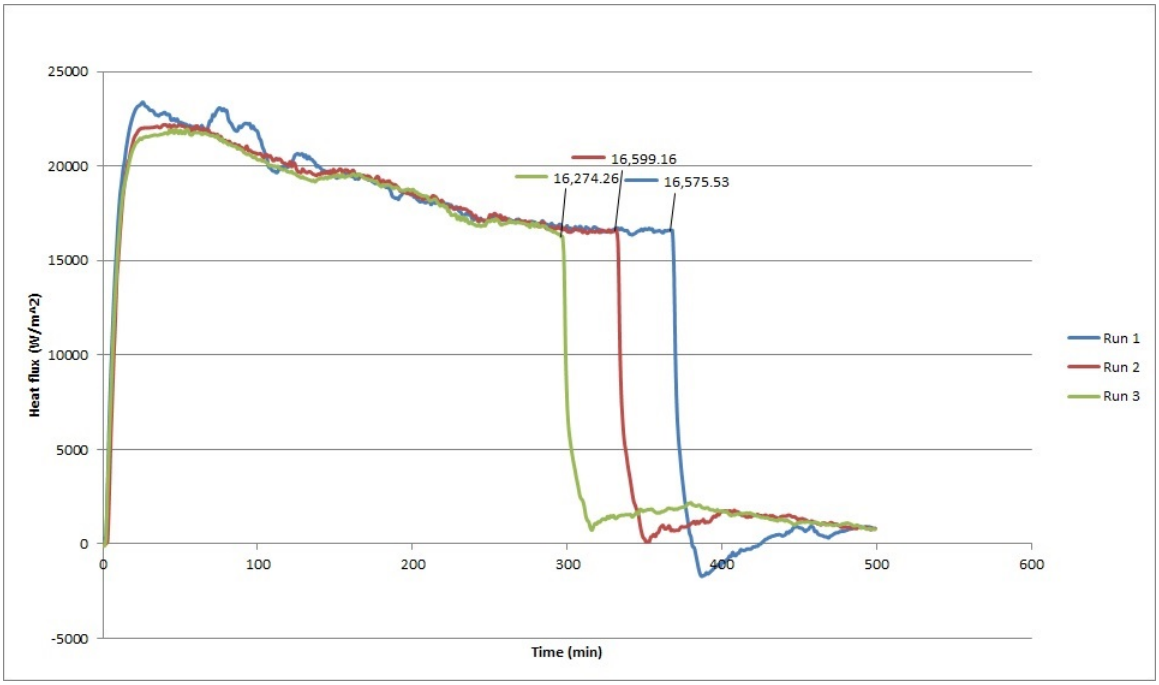


Fig. 5.12: Flux Outside Surface of Steel Pipe 1400°F

5.4 Flux at the Inside Surface of Steel Pipe

The flux at the inner surface of the steel pipe closely imitates the flux at the outer surface of the steel pipe. Higher flux occurs at the inner surface due to a smaller surface area for the flux to transfer through. As can be seen from the figures the maximum heat flux through the insulation varied from 11,600 to 22,000 W/m^2. As the temperature of the pipe increased, more heat flux through the insulation was observed as was expected.

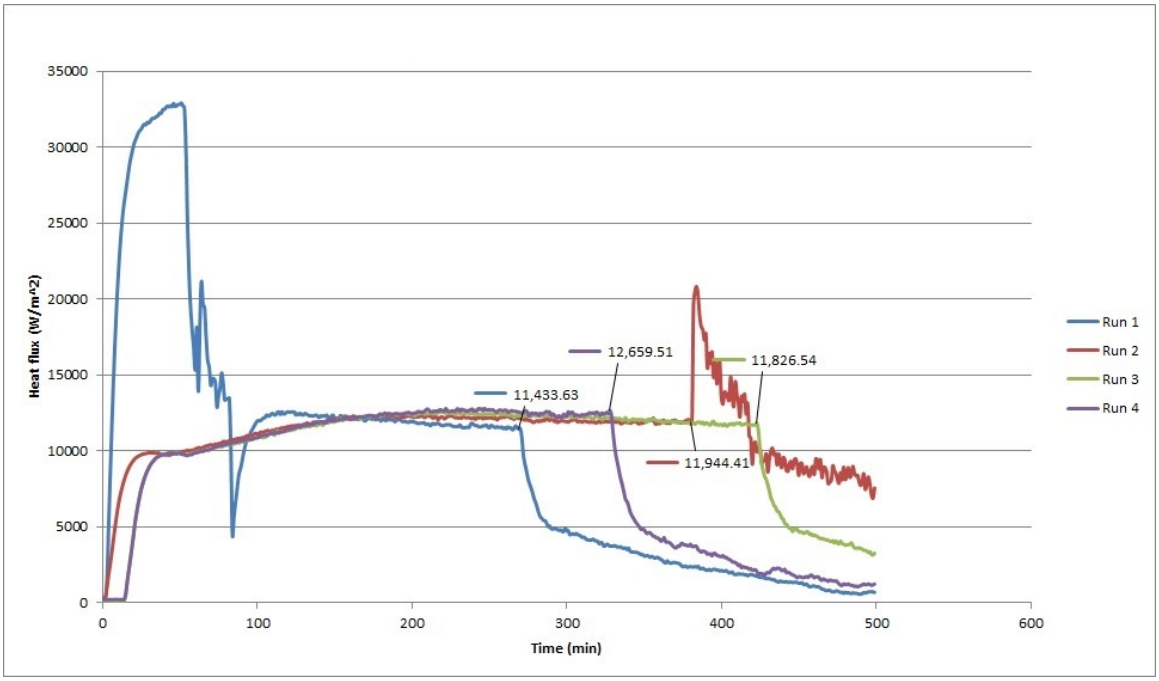


Fig. 5.13: Flux Inside of Steel Pipe 800°F

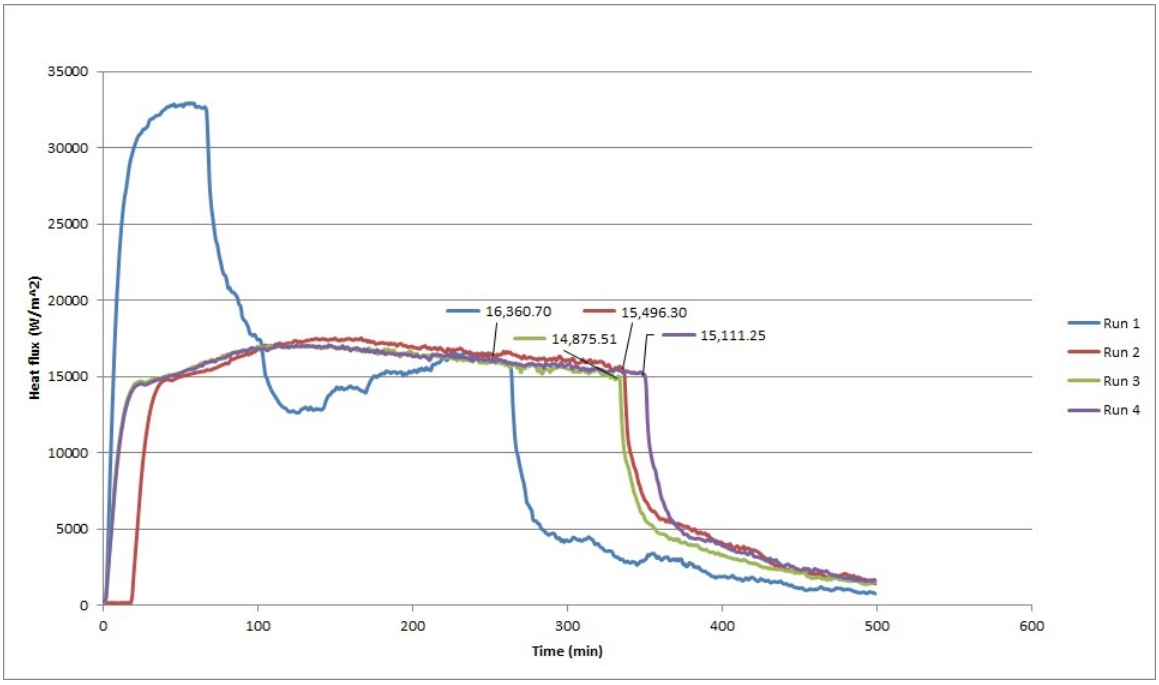


Fig. 5.14: Flux Inside of Steel Pipe 1000°F

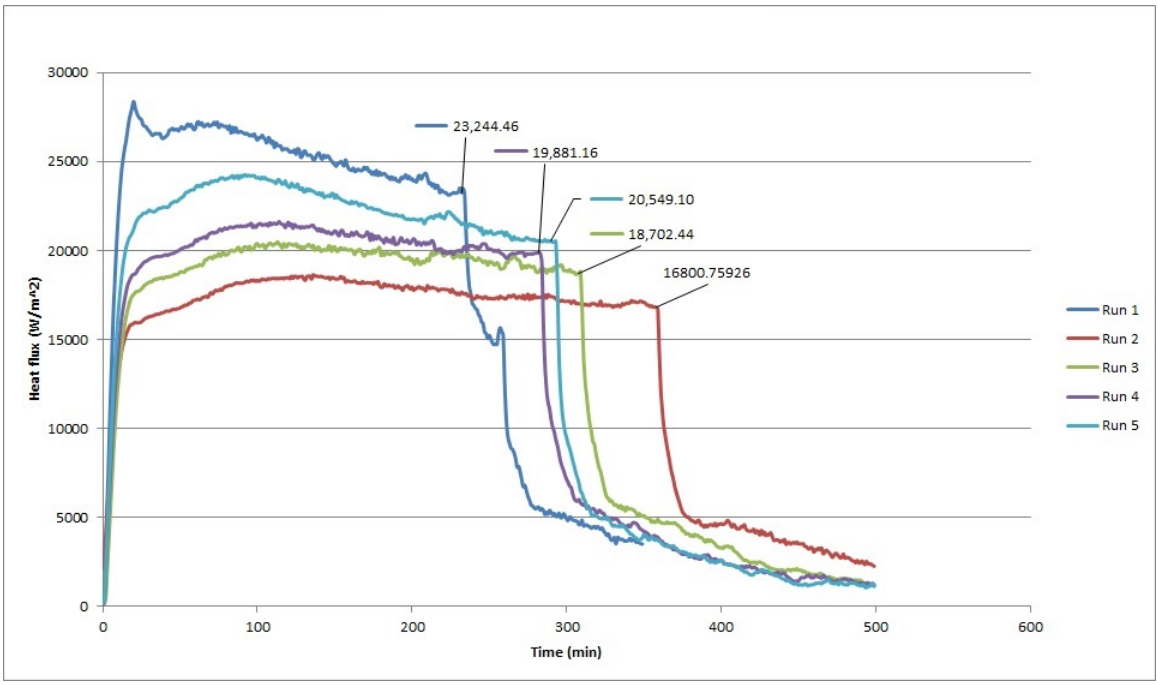


Fig. 5.15: Flux Inside of Steel Pipe 1200°F

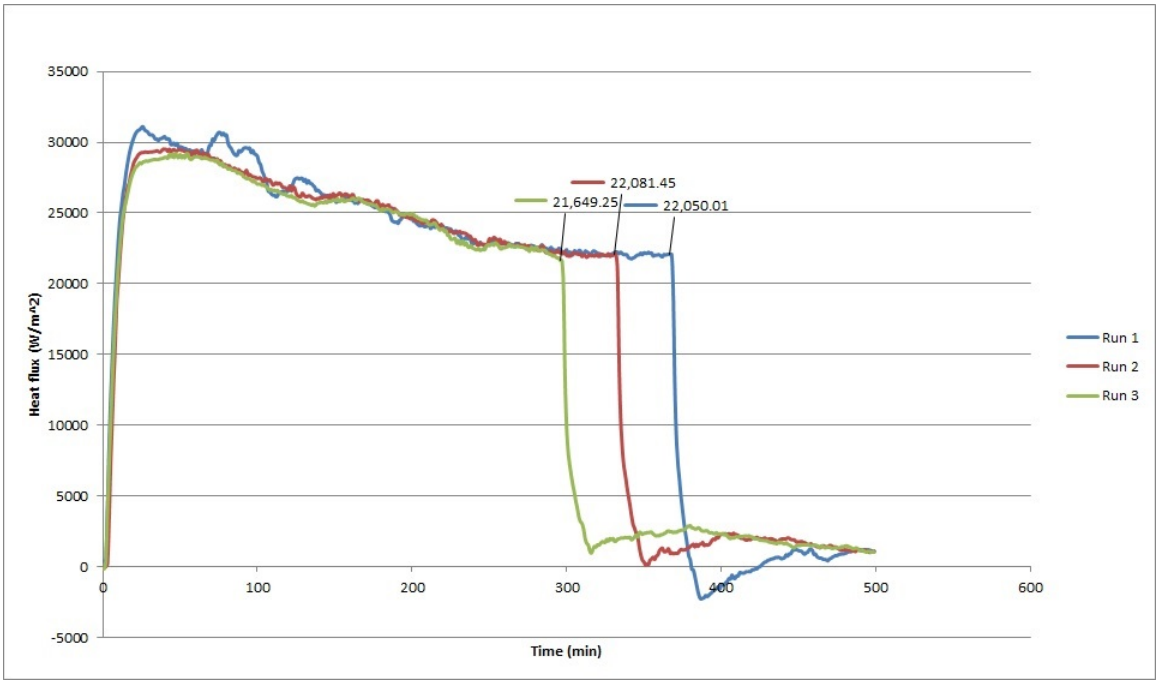


Fig. 5.16: Flux Inside of Steel Pipe 1400°F

5.5 Convection Coefficient at the Inside Surface of Pipe

As was discussed previously, data set run 1 shows some inconsistencies in the data due to temperature adjustments for 800°F and 1000°F. The initial start-up of the test results in some noise, due to the small difference in the initial temperatures of the steel pipe and the air inside the pipe. As can be seen from the figures the maximum heat transfer coefficient off the surface of the inside of the pipe varied from 90 to 155 W/m^2K. These high values of the heat transfer coefficients show that the system is moving a lot of heat in this area. The heat loss is due to the heat escaping out from the ends of the pipe and the gaps in the insulation as can be seen in the figure 3.21.

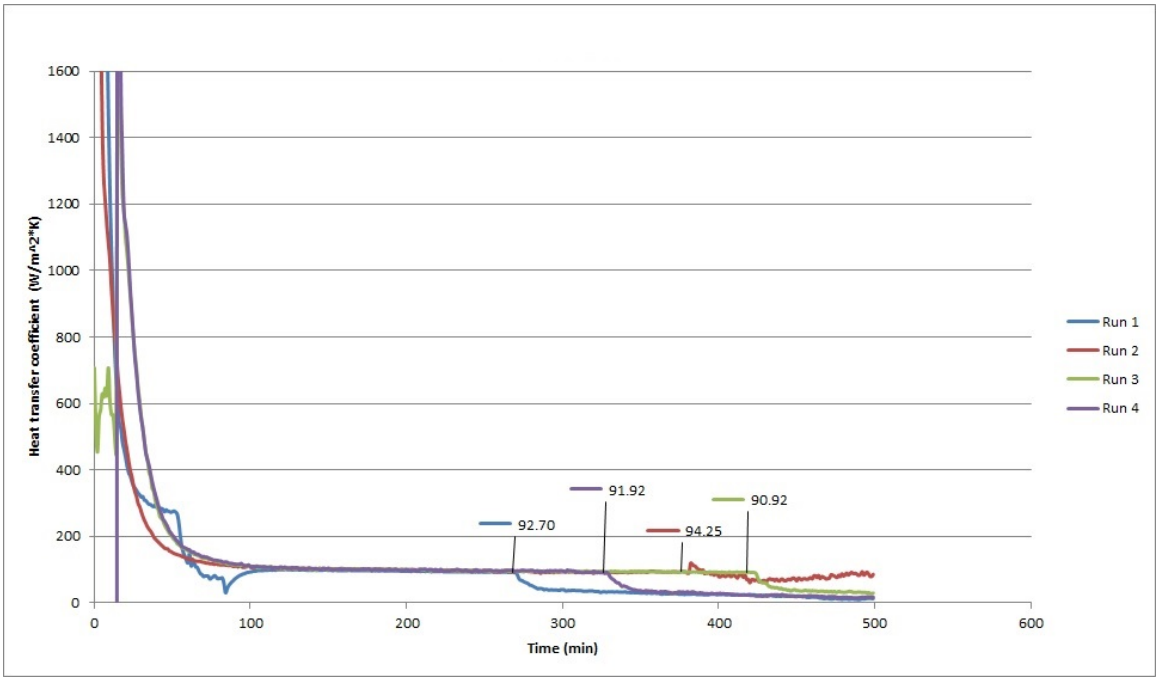


Fig. 5.17: Convection Coefficient off the Inside of Steel Pipe 800°F

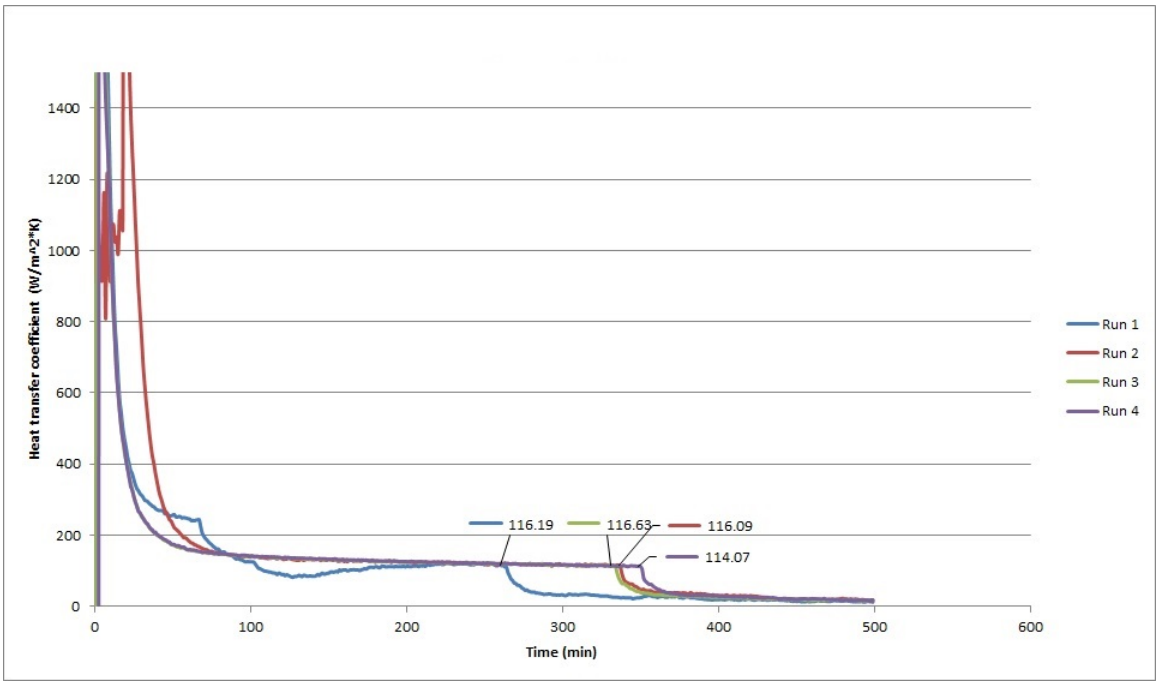


Fig. 5.18: Convection Coefficient off the Inside of Steel Pipe 1000°F

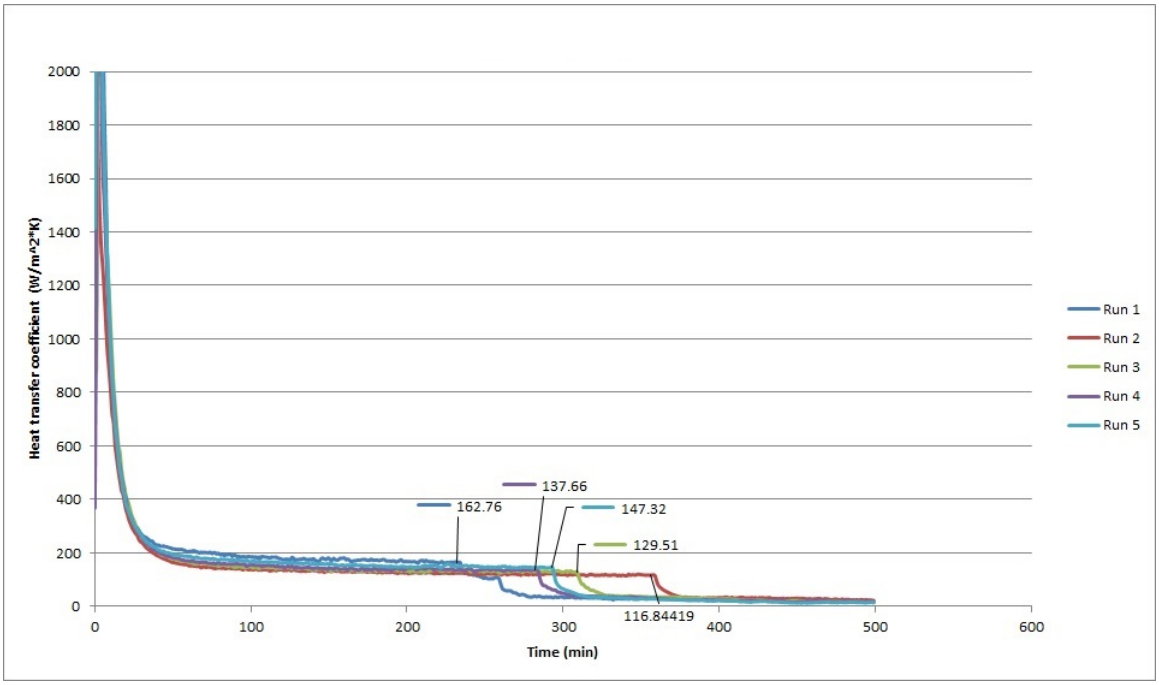


Fig. 5.19: Convection Coefficient off the Inside of Steel Pipe 1200°F

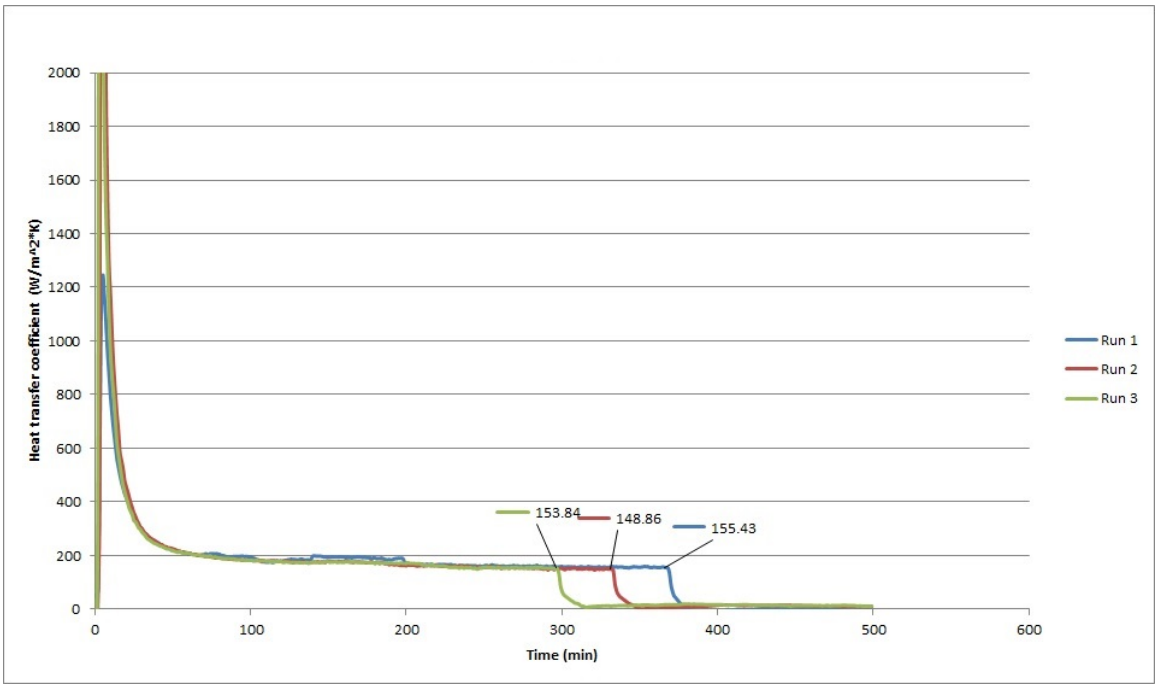


Fig. 5.20: Convection Coefficient off the Inside of Steel Pipe 1400°F

5.6 Resistance Between the Ceramic Heat Blanket and Pipe

This data provided very good results that is very consistent. The change in temperature has a minimal effect on the thermal contact resistance. The values of thermal resistance vary from 4.3 x 10^{-3} to 6.3 x 10^{-3} (m^2K/W) and can be correlated to the values found in the sixth edition of Fundamentals of Heat and Mass Transfer [15]. The derived values correlate but are slightly larger, some the reasons for differences include; less contact pressure between surfaces, the materials contacting are not the same, it has air gaps between links, and finally the heat blanket is not smooth because it is a slightly porous ceramic material.

Tables 5.1 through 5.5 summarize the heat transfer coefficients derived from the empirical data when the temperature reached steady state. These values provide good results in the forward heat-treatment model when analyzing at a steady state condition.

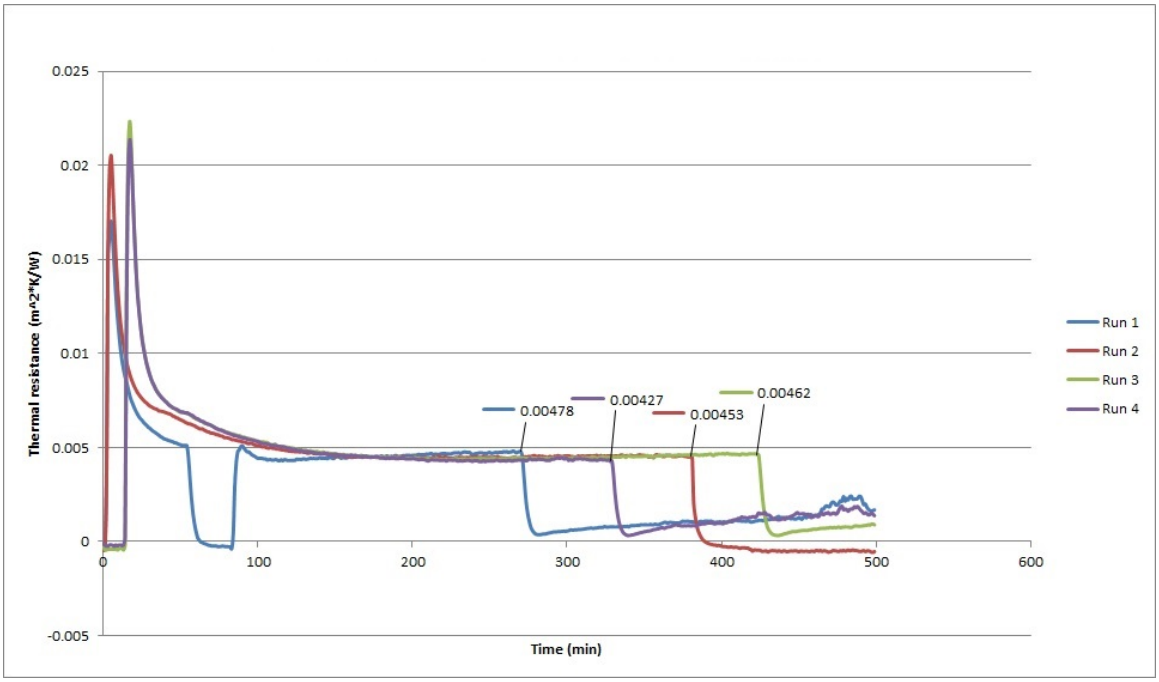


Fig. 5.21: Resistance between Heat Blanket and Pipe 800°F

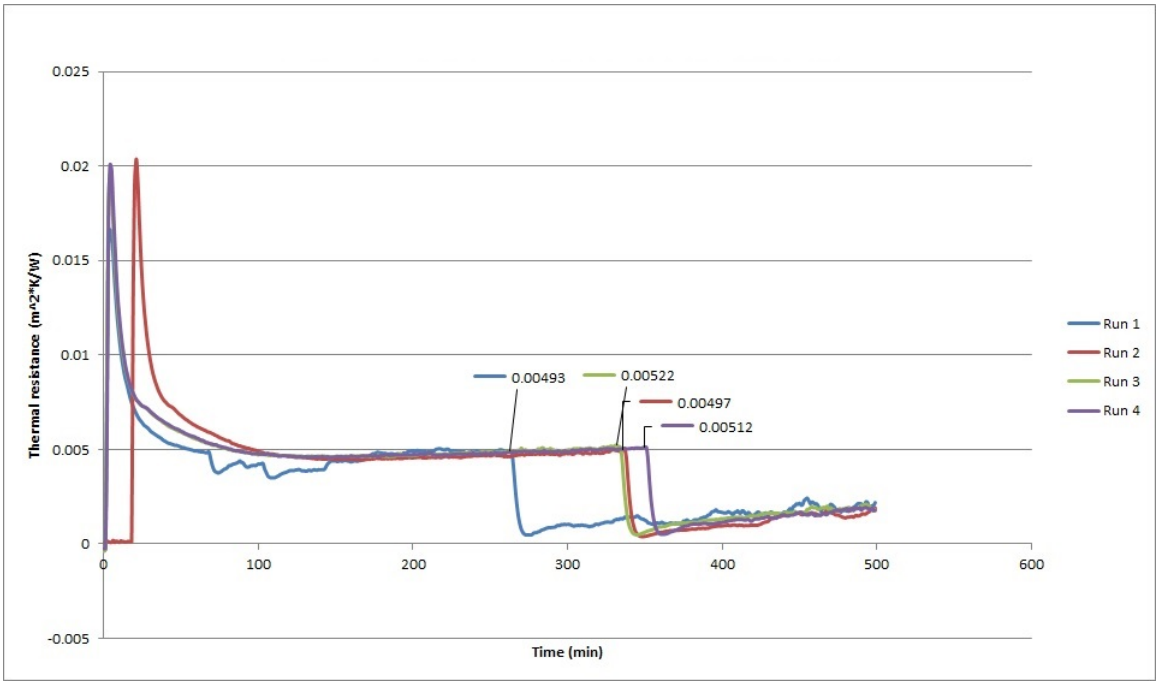


Fig. 5.22: Resistance between Heat Blanket and Pipe 1000°F

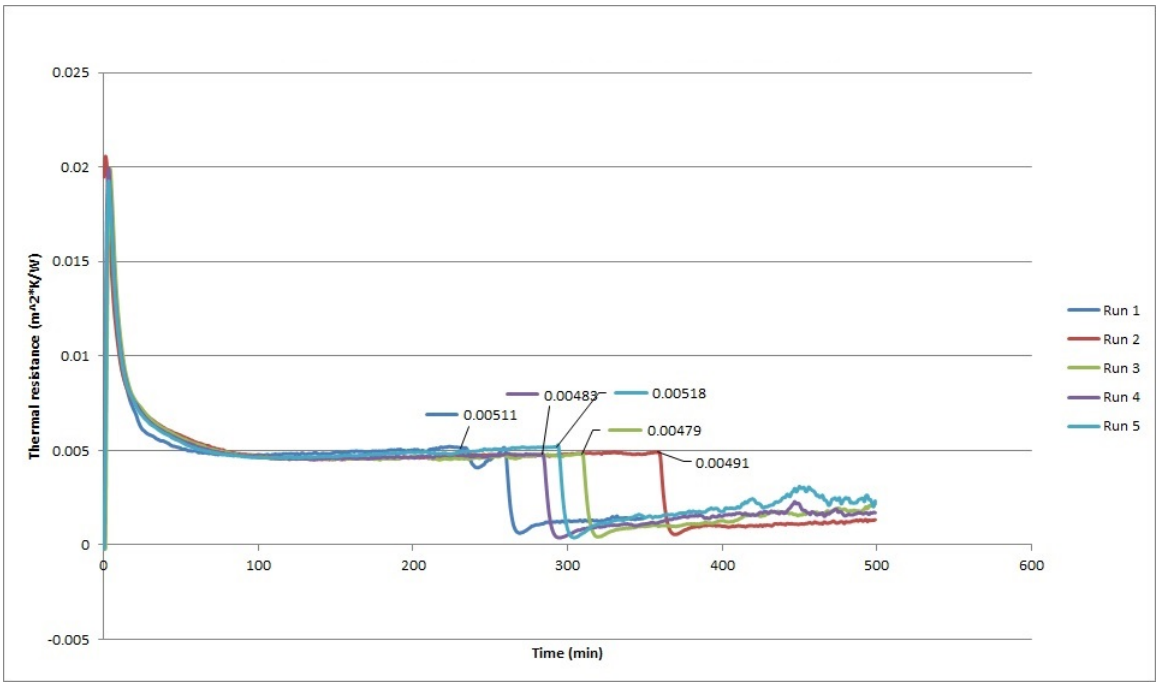


Fig. 5.23: Resistance between Heat Blanket and Pipe 1200°F

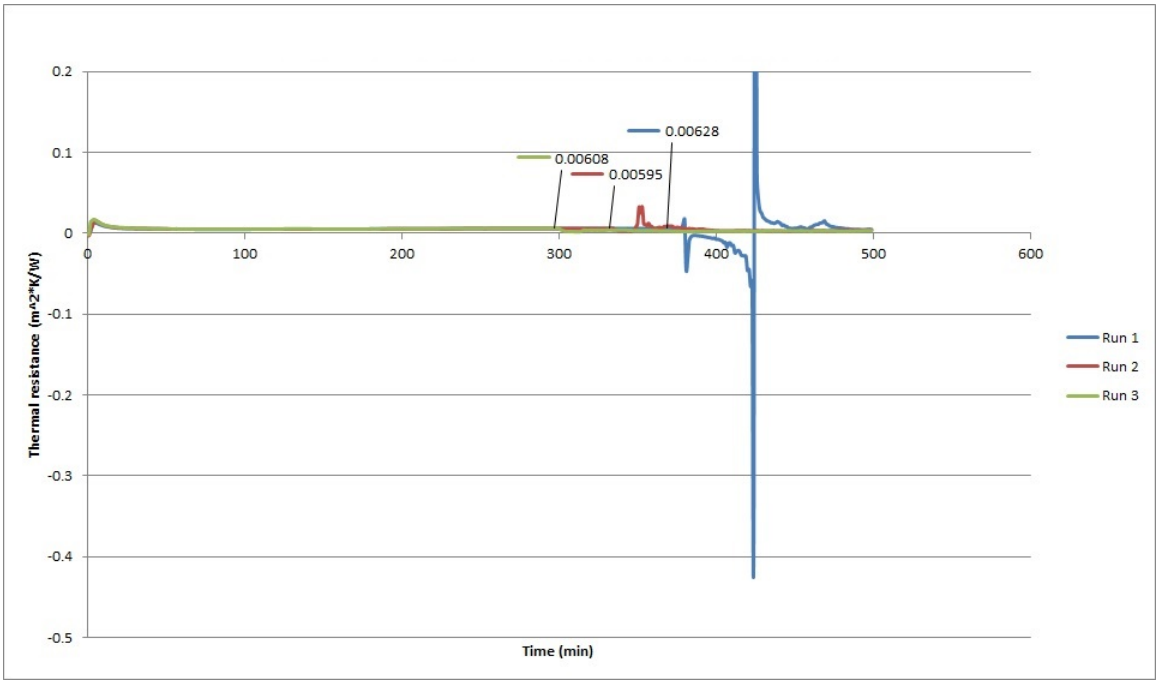


Fig. 5.24: Resistance between Heat Blanket and Pipe 1400°F

Table 5.1: Heat Transfer Coefficient off the Insulation

	800°F	**1000°F**	**1200°F**	**1400°F**
Run 1	10.94	12.68	15.41	17.73
Run 2	10.73	12.72	13.15	17.48
Run 3	10.83	12.91	13.71	17.41
Run 4	10.60	12.86	14.05	
Run 5			14.74	
Avg.	10.78	12.79	14.21	17.54

Table 5.2: Heat Transfer Coefficient off the Steel Pipe

	800°F	**1000°F**	**1200°F**	**1400°F**
Run 1	92.70	116.19	162.76	155.43
Run 2	94.25	116.09	116.84	148.86
Run 3	90.92	116.63	129.51	153.84
Run 4	91.92	114.07	137.66	
Run 5			147.32	
Avg.	92.45	115.75	138.82	152.71

Table 5.3: Resistance Between the Heat Blanket and Steel Pipe

	800°F	**1000°F**	**1200°F**	**1400°F**
Run 1	0.0048	0.0049	0.0051	0.0063
Run 2	0.0045	0.0050	0.0049	0.0060
Run 3	0.0046	0.0052	0.0048	0.0061
Run 4	0.0043	0.0051	0.0048	
Run 5			0.0052	
Avg.	0.0046	0.0051	0.0050	0.0061

Table 5.4: Heat Flux off the Outer Surface of Steel Pipe

	800°F	**1000°F**	**1200°F**	**1400°F**
Run 1	8,594.94	12,298.73	17,473.42	16,575.53
Run 2	8,978.90	11,648.95	12,629.54	16,599.16
Run 3	8,890.30	11,182.28	14,059.07	16,274.26
Run 4	9,516.46	11,359.49	14,945.07	
Run 5			15,447.26	
Avg.	8,995.15	11,622.36	14,910.89	16,482.98

Table 5.5: Heat Flux off the Inner Surface of Steel Pipe

	800°F	**1000°F**	**1200°F**	**1400°F**
Run 1	11,433.63	16,360.70	23,244.46	22,050.01
Run 2	11,944.41	15,496.30	16,800.76	22,081.45
Run 3	11,826.54	14,875.51	18,702.44	21,649.25
Run 4	12,659.51	15,111.25	19,881.16	
Run 5			20,549.10	
Avg.	11,966.02	15,460.94	19,835.58	21,926.90

CHAPTER 6
FORWARD HEAT TRANSFER MODEL

6.1 Introduction

Although the heat transfer coefficients in tables 5.1 through 5.5 provide good results at the steady state condition it is desirous to know the full heat cycle of the heat treatment, this allows one to know how long a sufficient heat treatment might be in a specific practical application.

Therefore, the forward model was set up to use the derived equations for the temperatures at the desired surfaces, the derived heat transfer coefficients, and the heat flux at every time step. This allows one to determine transient temperatures for the entire heat treatment temperature profile.

The forward model allows the user to input parameters that drive the program. The user input parameters are as follows; the desired heat treatment temperature (minimum temperature at which the coldest part of the steel pipe must obtain), the surrounding ambient temperature, the diameter and the thickness of pipe. Once these user inputs have been submitted the program then analyzes which heat transfer coefficient data set to use, driven by the user input minimum required temperature.

The program uses linear interpolation to calculate appropriate values to enter into each of the equations. The program begins by identifying which data set to plug into the equations. The data sets come from the calculated heat transfer coefficients, heat blanket temperatures, and heat flux that was obtained from the tests conducted and empirical data collected.

6.2 Statement of Limitations and Considerations

All data and results used in this model were derived from experiments done in an

environmentally controlled lab. This forward model is only intended to be used as an assist in the PHWT process to predict heat transfer in pipe sections, all codes and standards for proper PWHT of Grade 91 must be followed.

The forward model assumes axisymmetric conditions, this condition must be present if the results from this model are to be applied to a PWHT setup.

Values of the heat transfer coefficient at the inside surface of the steel pipe may vary for long sections of pipe or for pipe with an internal air flow.

Finally the model uses linear interpolation to calculate values for temperatures between those that were gathered through experimental trials, this must be taken into consideration when other PWHT temperatures are desired and final model results are analyzed for field use.

6.3 Equations Used for the Forward Heat Transfer Model

The forward heat transfer model uses the fundamental heat transfer equations to calculate temperatures. In order to achieve this the fundamental heat transfer equations are solved for the temperatures of each surface in the heat treatment set-up. The temperatures of interest are; the outer surface of the insulation, the outer diameter of the pipe, inner diameter of the pipe, and the inner pipe air temperature.

Temperature of the Surface of the Insulation:

Using the convection coefficient equation, reference equation 3.2. Where *(h_i)* is the convection coefficient off of the insulation, *(q_i")* is the flux at the outer surface of the insulation, *(h_∞)* is the ambient air, and *($T_{s,2}$)* is the temperature at the outer surface of the insulation. Solving for *($T_{s,2}$)* we get;

$$T_{s,2} = T_\infty + \frac{q_i"}{h_i} \tag{6.1}$$

Temperature of the Outer Surface of the Pipe:

Using the resistance equation between two contacting surfaces, reference equation 3.6. Where *(R_t, c")* is the resistance between the heat blanket and the surface of the steel pipe, *(q_o")* is the flux at the outer surface of the steel pipe, *(T_A)* is the Temperature of the heat blanket, and *(T_B)* is the temperature at the outer surface of the steel pipe. Solving for *(T_B)* we get;

$$T_B = T_A - R_t, c" \times q_o" \tag{6.2}$$

Temperature of the Inner Surface of the Pipe:

Using the equation for determining heat flux in cylindrical coordinates, reference equation 3.4. Where *($q_{s,i}$")* is the flux at the inner surface of the steel pipe, *(k_s)* is the conduction coefficient of the steel pipe, *(r_1)* is the inner radius of the steel pipe, *(r_2)* is the outer radius of the steel pipe, *($T_{s,1}$)* is the temperature at the outer surface of the steel pipe, and *($T_{s,2}$)* is the temperature at the inner surface of the steel pipe. Solving for *($T_{s,2}$)* we get;

$$T_{s,2} = T_{s,1} + \frac{q_{s,i}"[r_1 \times ln(r_2/r_1)]}{k_s} \tag{6.3}$$

Temperature of the Air Inside the Pipe:

Using the convection coefficient equation, reference equation 3.5. Where *(h_s)* is the convection coefficient off of the steel pipe, *($q_{s,i}$")* is the flux at the inner surface of the steel pipe, *($T_{s,1}$)* is the temperature at the inner surface of the steel pipe, and *($T_{s,\infty}$)* is the temperature of the air inside of the steel pipe. Solving for *($T_{s,\infty}$)* we get;

$$T_{s,\infty} = T_{s,1} - \frac{q_{s,i}"}{h_s} \tag{6.4}$$

Using these equations, the heat transfer coefficients in tables 5.1 through 5.3, and the heat flux values from tables 5.4 and 5.5, the temperatures can be found at each of the temperature locations in the steady state condition.

6.4 Forward Heat Transfer Model Results

The forward model was checked in multiple ways to ensure reliable results. First, the program was ran at each temperature that the empirical data was collected at and a comparison was made. The comparison resulted in a very good match and reliable results as seen in 6.1. Second, the program was tested at many different temperatures to ensure that the program is providing good results for any temperature between the bounds of empirical data. Temperature traces can be seen for three midpoint temperatures in figures 6.2, 6.3, and 6.4. Third, the program was tested out for many different pipe sidewall thicknesses, comparisons can be made with the resulting temperature profiles in figures 6.5 and 6.7. Fourth, the model was analyzed at different pipe diameters, comparisons can also be made with the resulting temperature profiles in figures 6.6 and 6.8. Finally, the program was run at different ambient temperatures, the results from this can be seen in figures 6.9 through 6.12.

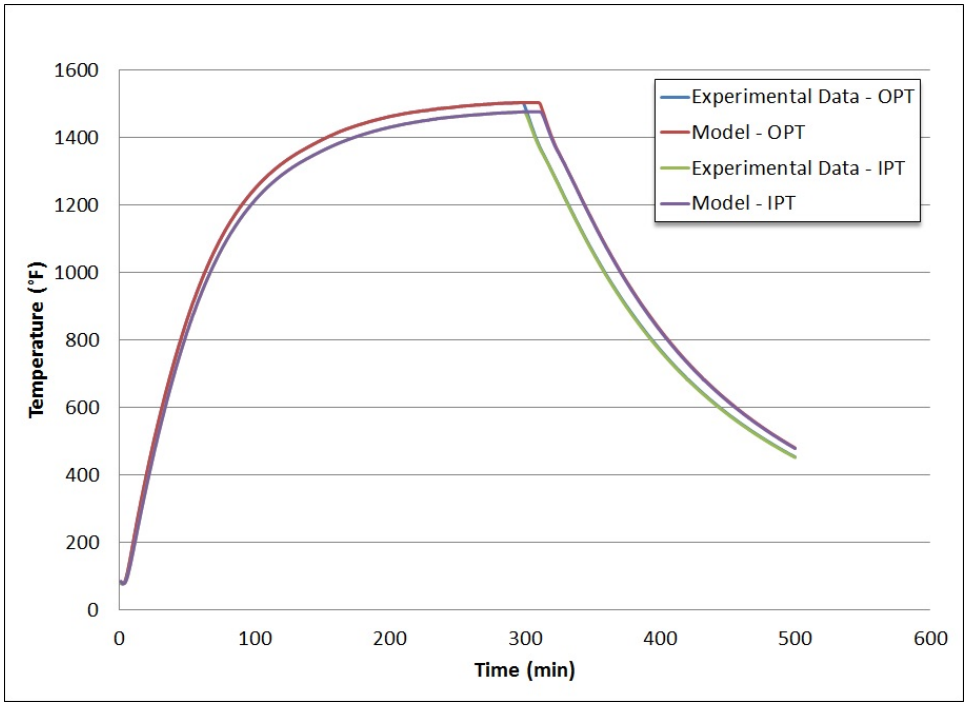


Fig. 6.1: Comparison of the Model and Data at 1400F

Temperature Runs Between Empirical Data Collection Points:

When the forward model was ran with various minimum required temperatures the model proved to compare very accurately with the empirical data. Figures 6.2, 6.3 and 6.4 show that the model also works for temperatures between the targeted temperature points used to collect the empirical data. Each of these runs held the pipe diameter, pipe thickness and ambient temperature constant so a valid comparison could be made. Comparisons of similarity can be made with the charts in figures 4.1 through 4.16

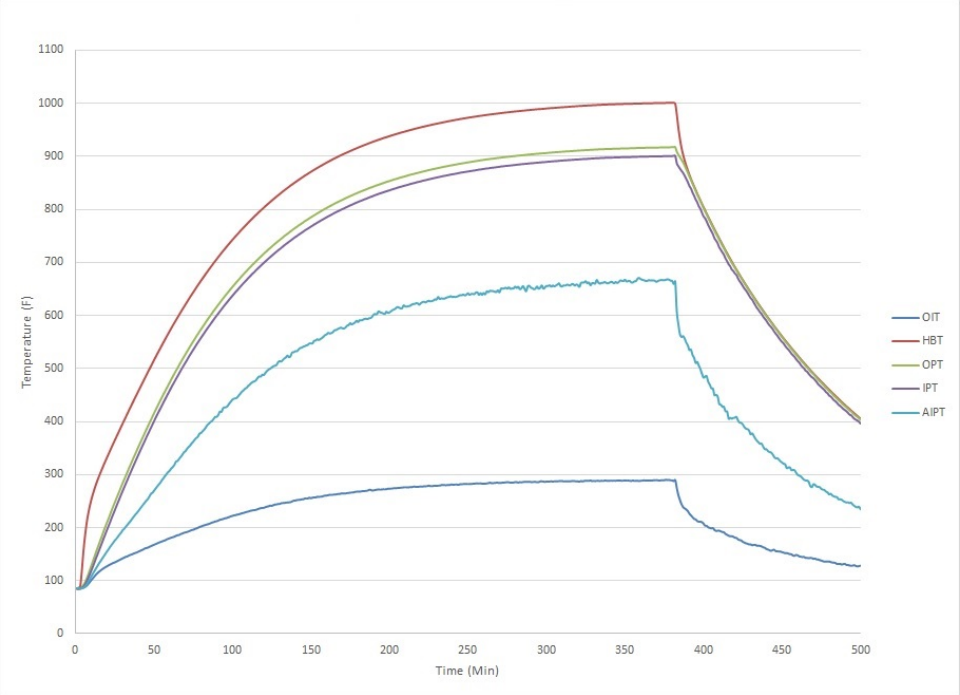


Fig. 6.2: Temperature Run at 900°F from the Forward Heat Treatment Model

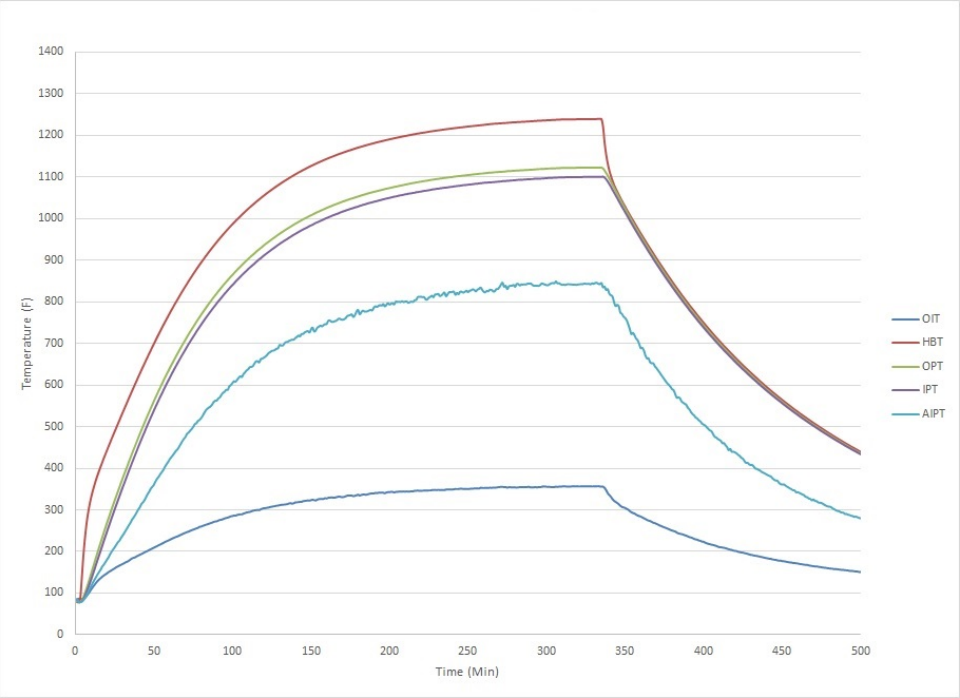


Fig. 6.3: Temperature Run at 1100°F from the Forward Heat Treatment Model

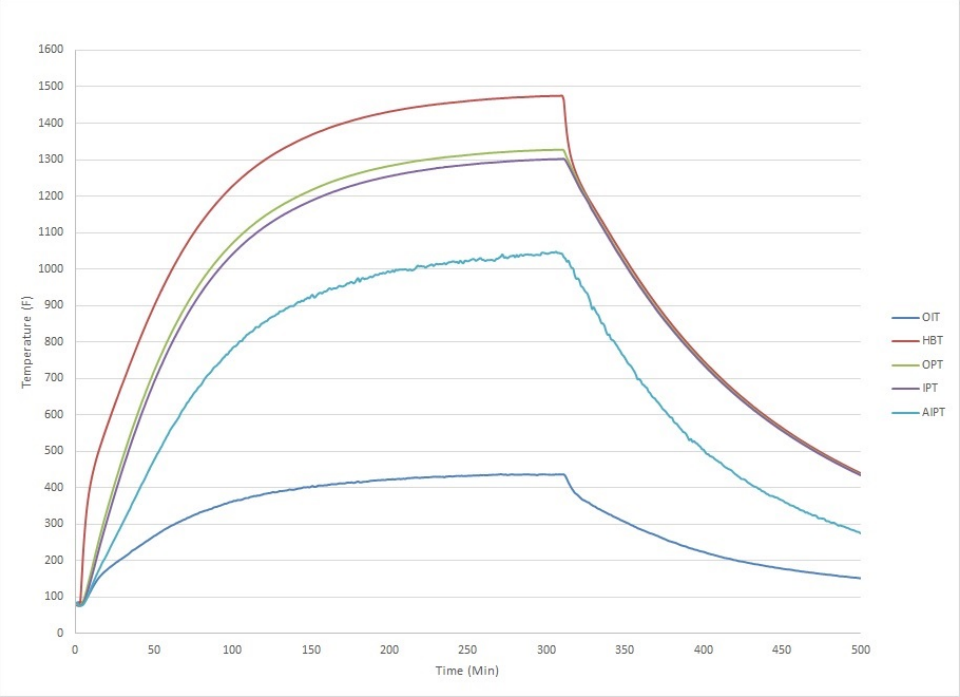


Fig. 6.4: Temperature Run at 1300°F from the Forward Heat Treatment Model

Temperature Runs with Variances of Pipe Thickness and Diameter:

When the forward model was ran with variations in pipe thickness and diameter, the temperature traces behaved as expected. When the pipe thickness was increased the required maximum heat blanket temperature also increased, the opposite was observed when the thickness decreased. The other noted change that also expectedly occurred was the increase and decrease in outer pipe temperature resulting in a greater and lesser delta of outer and inner pipe temperatures. This is a very important item to observe prior to a heat treatment to ensure that the maximum temperature in a PWHT does not go above the lower critical temperature possibly resulting in untempered martensite when cooled.

When the model is ran at differing pipe diameters, the change in temperature due to the change in diameter of the pipe used to collect the empirical data was very small, less than 1°F.

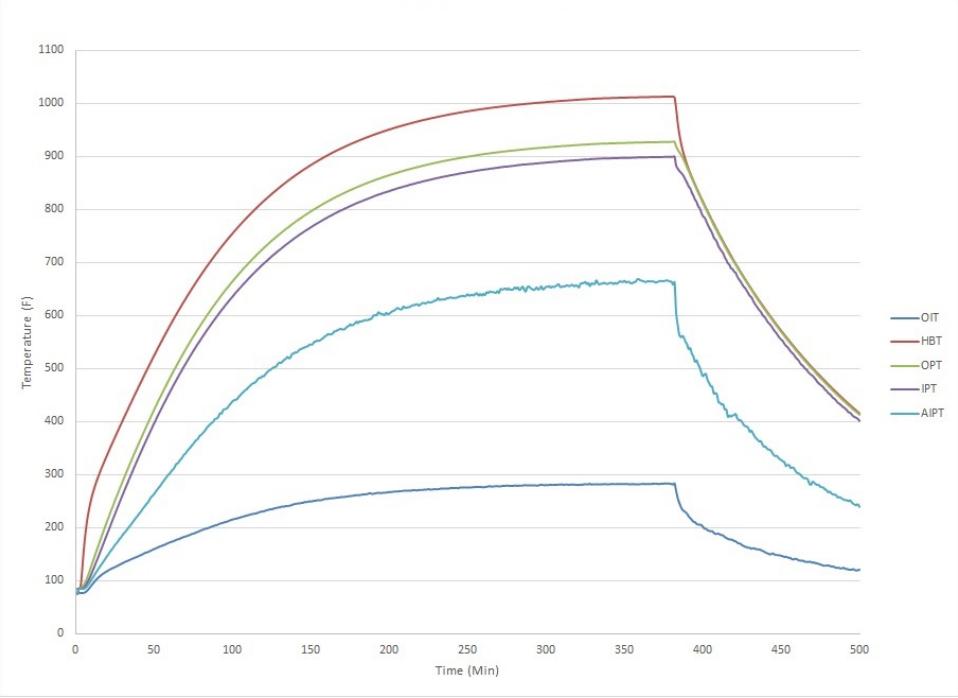


Fig. 6.5: 900°F with a 3" Sidewall Thickness from the Forward Heat Treatment Model

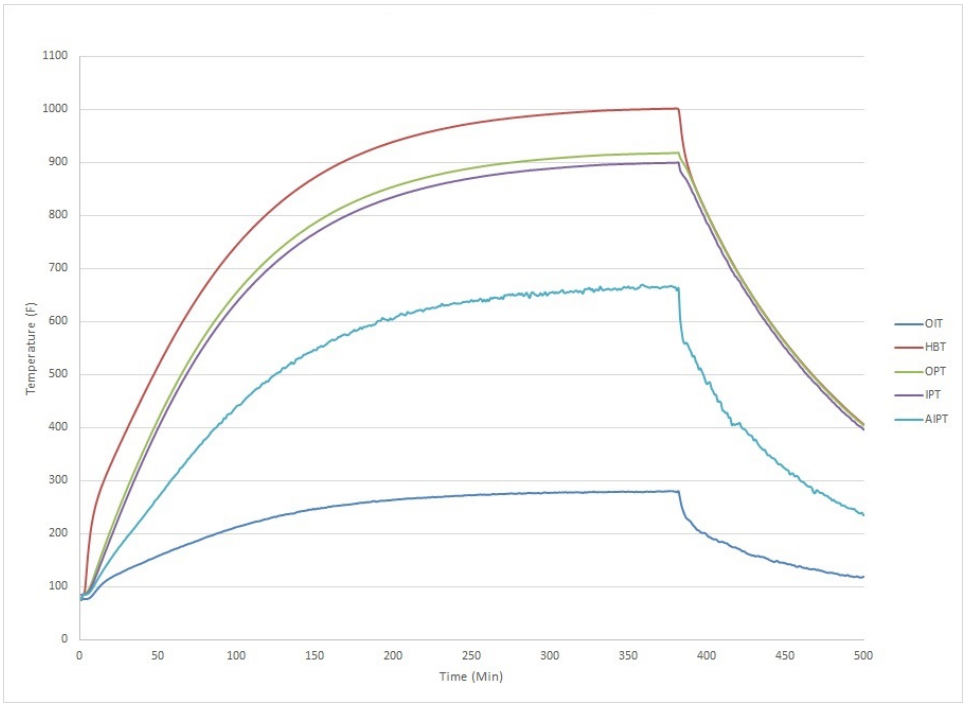


Fig. 6.6: 900°F with a 24" Diameter Pipe from the Forward Heat Treatment Model

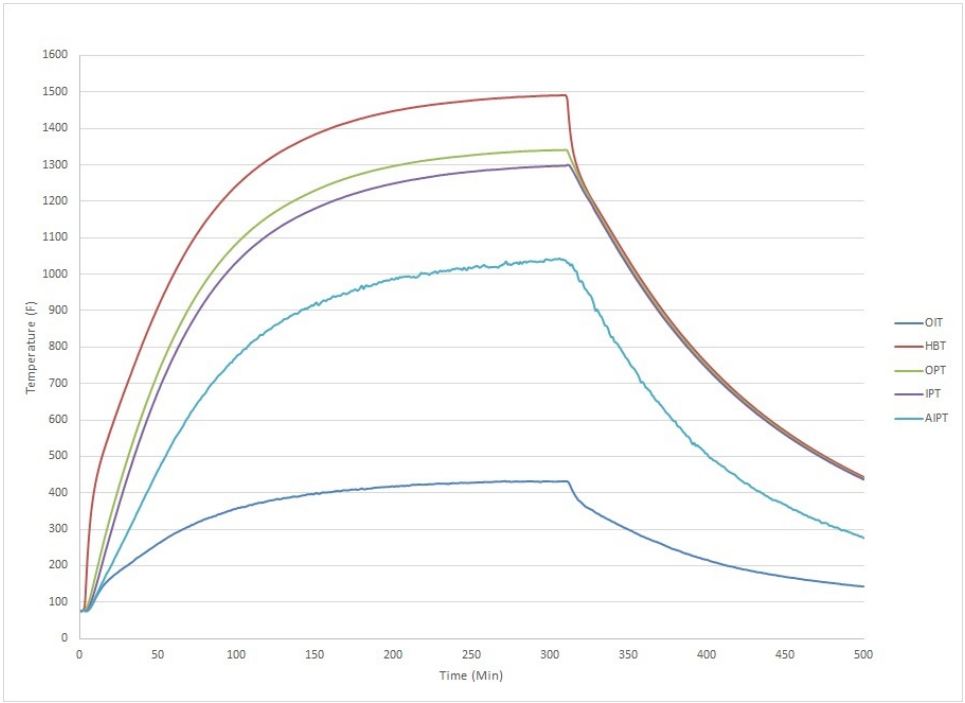


Fig. 6.7: 1300°F with a 3" Sidewall Thickness from the Forward Heat Treatment Model

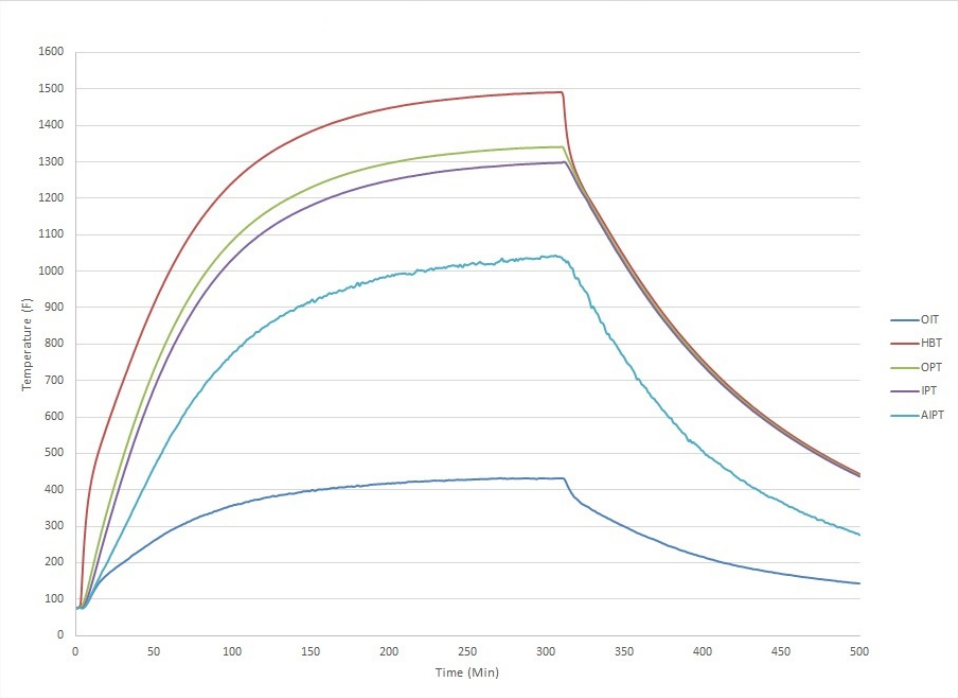


Fig. 6.8: 1300°F with a 24" Diameter Pipe from the Forward Heat Treatment Model

Temperature Runs with Variances in Ambient Temperature:

When the forward model was ran with changes in ambient temperatures some inconsistencies from what was expected were observed. The main temperature that was affected by the change in ambient conditions was the outer surface of the insulation, this change behaved as expected. However, the initial transient effect of the pipe temperatures and internal pipe air temperature did not behave as expected, as can be seen from figures 6.9 through 6.12. As the ambient temperature approaches typical controlled room temperatures, the forward model results behave as expected, however the further the ambient temperature diverges from that controlled condition the more of a discontinuity is portrayed in the initial transient stage from the forward model. Further work could be done to better define this stage of the heat transfer model. This could be done by obtaining more empirical data at differing ambient conditions.

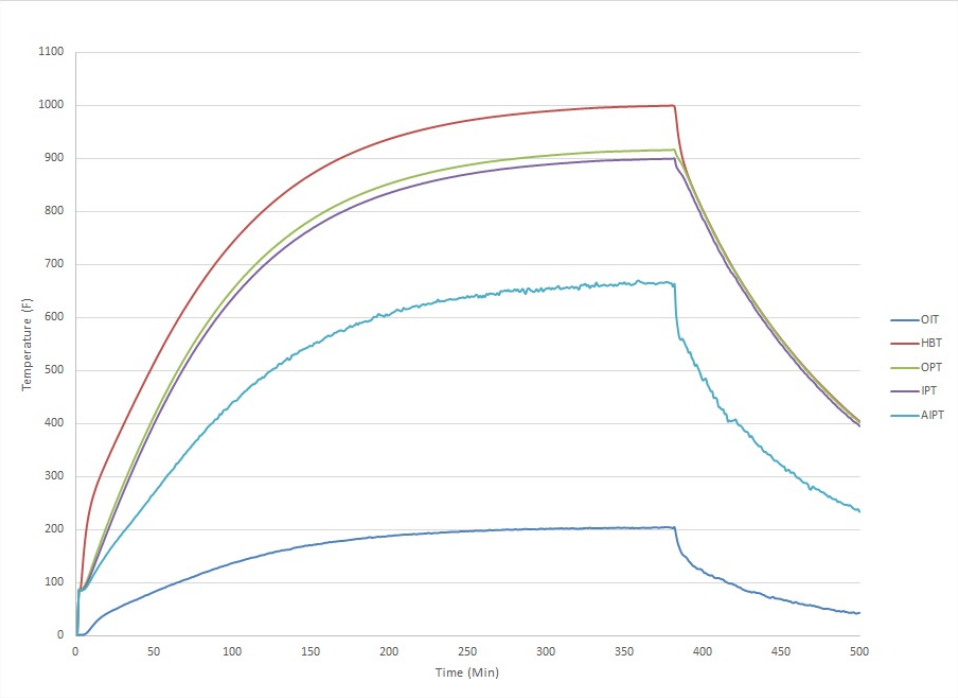


Fig. 6.9: 900°F with an Ambient Temperature of 0°F from the Forward Model

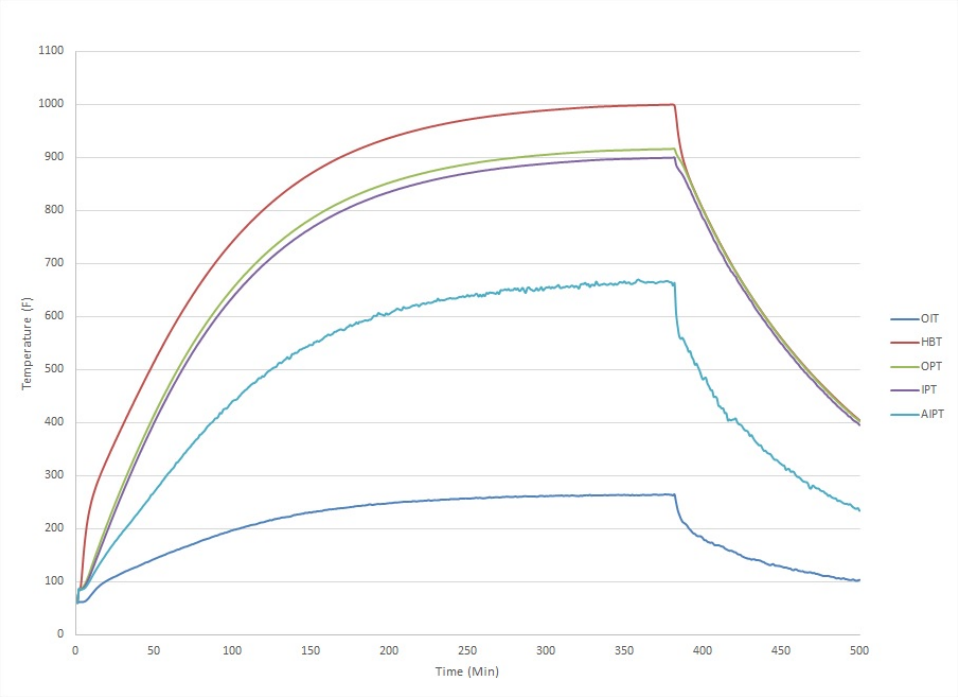


Fig. 6.10: 900°F with an Ambient Temperature of 60°F from the Forward Model

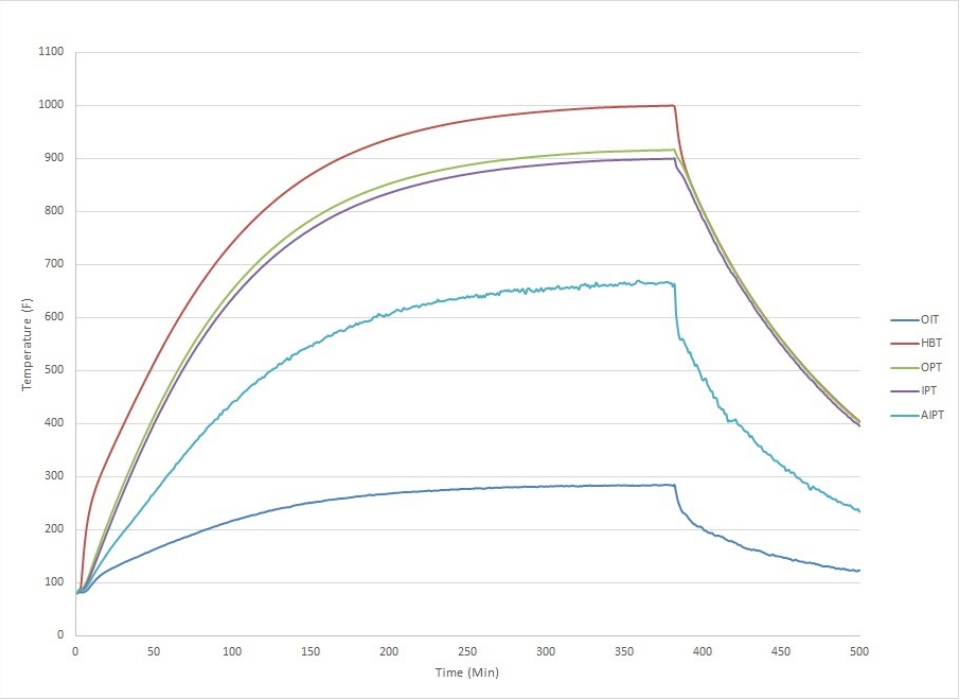


Fig. 6.11: 900°F with an Ambient Temperature of 80°F from the Forward Model

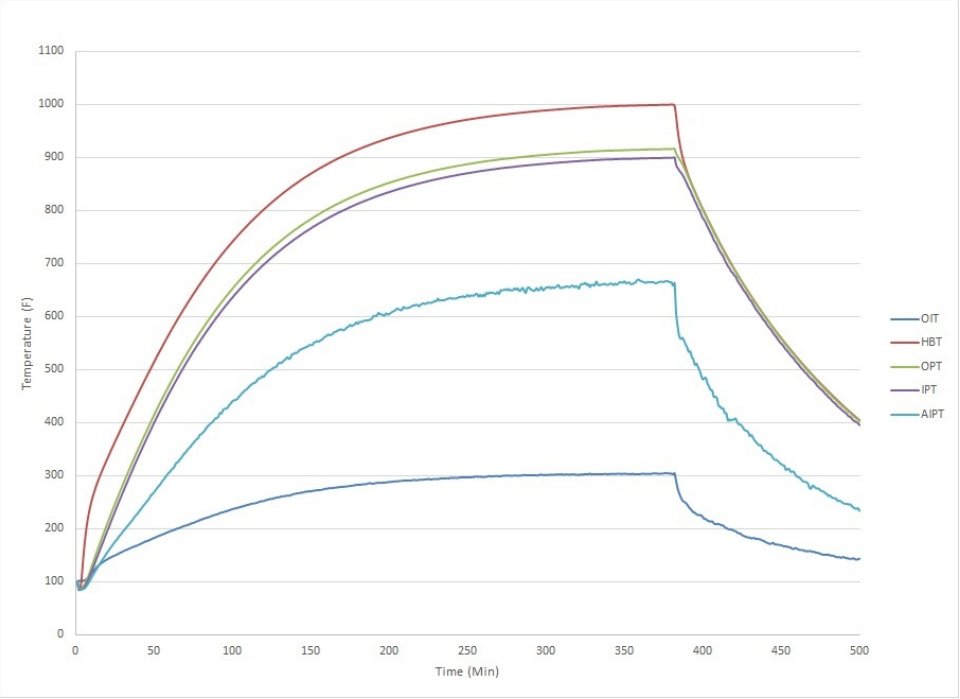


Fig. 6.12: 900°F with an Ambient Temperature of 100°F from the Forward Model

6.5 Final Results Discussion

The heat transfer coefficients that have been derived from the collected empirical data have proven to be accurate and useful for predicting the temperature profiles that exist in a PWHT of P91 steel. Very accurate results can be found from using the derived heat transfer coefficients when one uses similar or exact equipment used in this study for a PWHT.

A forward heat-treatment model was created that predicts the temperatures at critical points. The results from the forward model inform the user the maximum and minimum temperatures the pipe will see, the maximum temperature that the heat blanket will reach in order to achieve the desired pipe temperature, and the time that it takes to get to the PWHT temperature. Other items that could prove to be useful for the user is cool down time, inner pipe temperature, and surface temperature of the insulation.

The forward model requires user inputs. These inputs are; minimum required temperature of the coldest part of the pipe (inner pipe surface), pipe diameter, pipe thickness, and ambient temperature. The model will accurately predict the temperature profile with changes in PWHT temperatures, pipe diameter and thickness. Further work could be done to more accurately predict the PWHT temperature profile with changes in ambient conditions.

This model can prove to be very useful in estimating the temperature profile of an on-site PWHT. It will assist one in knowing the maximum and minimum temperatures that a pipe will see during the PWHT so that a proper PWHT is achieved. It will also assist in predicting the total time that will be needed to perform the PWHT. These results could also be compared and used with microstructure studies that have been performed to maximize toughness and creep properties for specific applications in industry.

CHAPTER 7

CONCLUSION

As with most metallic materials grade 91 steel requires a very specific heat treatment process. This process includes a specific temperature and duration at that temperature to achieve the material properties desired. Extensive research has been done to determine the adequate temperatures and duration to provide the proper microstructure for the superior mechanical properties that are inherent to Grade 91 steel.

The welded sections are typically large structures that require local heat treatments and cannot be placed in an oven. The locations of these structures vary from indoors in a controlled environment to outdoors with unpredictable environments. These environments can be controlled somewhat, however in large part the surrounding conditions are unchangeable.

This study has investigated experimentally and numerically the heat transfer and temperature fields of Grade 91 piping in a local heat treatment. The appropriate heat transfer coefficients have been determined utilizing a ceramic heat blanket, through an inverse method by collecting actual data from different temperatures. The heat transfer coefficients have been used to set up a model to determine the appropriate post-weld heat treatment conditions for Grade 91 steel. These coefficients enable one to run the forward analysis with the specific geometry and conditions they will encounter in the heat treatment process for their application. The analysis provides a theoretical determination of time and temperatures needed to maintain a proper post weld heat treatment for the welded section. Finally, time and temperature combinations have been compared with experimentally measured data.

In industry there is an ever-ongoing effort to maximize efficiency, minimize costs and resources while achieving superior results in products. For grade 91 steel, a proper PWHT is of utmost importance to achieve its desired mechanical properties. This research and model

allow the user to quickly analyze the heat treatment prior to implementation. This quick inexpensive method can help the engineers and technicians determine the cost to achieve a proper treatment by understanding temperatures and time that would be necessary.

This research is very beneficial to the joining of metals industry primarily because it provides a way to ensure the method used to heat treat the welded section is being done properly and the required heat-treatment is achieved. It is applicable to many different geometries so that it can be modified to specific situations. It is also beneficial because it assists in predicting the total time that will be needed to perform the PWHT, and finally it is beneficial because these results can be compared and used with microstructure studies that have been performed to maximize toughness and creep properties for specific applications in industry.

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APPENDICES

APPENDIX A

Fortran Program for Calculating the Forward Model

F:\Thesis stuff\THESIS DATA\Grade 91 program and data\Heat transfer in Grade 91 Steel.f95

```
  !_____________________________________________________________________________________________
>>_____!
  module precision_module
  implicit none

  integer,parameter :: sp=SELECTED_REAL_KIND(6,37)
  integer,parameter :: dp=SELECTED_REAL_KIND(15,307)
  integer,parameter :: prec=dp
  !integer, parameter :: spc = kind((1.0_sp,1.0_sp))
  !integer, parameter :: dpc = kind((1.0_dp,1.0_dp))
  !integer, parameter :: cprec = spc
  end module precision_module
  !_____________________________________________________________________________________________
>>_____!

  Program heat_transfer
  use precision_module
  !use Calculations

  Implicit none
  ! Purpose:
  !  To calculate the heat transfer of Grade 91 steel using a ceramic Thermal Blanket
  !
  !
  ! Record of Revisions:
  ! Date:    Programmer:  Description of change:
  ! =======    ============ ======================
  ! 1 March 2017  J. Walker  Original Program


  !Character(len=20) :: File,Fileout,r_out,q_out
  !Integer::Status,Status1,i,j,x,ierror1
  Character(len=30) :: File_read1,File_read2,File_read3,File_read4
  Integer::Status,Status1,status2,status3,status4,i,j,x,ierror1,ierror2,ierror3,ierror4
  Real (kind = prec), Allocatable, Dimension(:,:)::arr1, arr2  !Stored Heat transfer coefficient
>>s
  Real (kind = prec), Allocatable, Dimension(:,:)::arr3   !Stored Interpolated Heat transfer coe
>>fficients
  Real (kind = prec), Allocatable, Dimension(:,:)::arr4, arr5  !Stored Heat Blanket Temperature
>>
  Real (kind = prec)::Httemp   !Heat treatment temperature to run the analysis at
  Real (kind = prec)::L,Ro,Ri,T_hb,T_i,Rii,Roi,W,ks,ki,Tave, Pd, Pt, m_ax
  Real (kind = prec)::Tinf   !environment temperature
  Real(kind = prec), Dimension(500)::OIT  !Outer insulation temperature
  Real(kind = prec), Dimension(500)::HBT  !Heat blanket temperature
  Real(kind = prec), Dimension(500)::OPT  !Outer Pipe Temperature
  Real(kind = prec), Dimension(500)::IPT  !Inner Pipe Temperature
  Real(kind = prec), Dimension(500)::AIPT !Ambient Inner Pipe Temperature

  Integer:: count


  !DEFINITIONS!
  !*********************************************************************************************
  !arr1:    Array in which all temperature data is stored         *
  !rho=7760.  !Density of Grade 91 Steel at 20°C (kg/m^3)          *
  !Cp=622.   !Specific Heat of Grade 91 Steel at 20°C (J/kg*K)       *
  L=0.027   !Thickness of steel pipe (meters)             *
  !Roo=0.2175/2.   !Original Outer radius of Pipe Section (meters)       *
  !Rio=0.1635/2. !Original Innner Radius of pipe Section (meters)       *
  t_hb=0.0127  !Thickness of heat blanket              *
```

```
  t_i=0.0254  !Thickness of insulation blanket            *
  !Rii=Rio+T_hb !Inner radius of insulation around pipe section (meters)      *
  !Roi=Rii+T_i  !Outer radius of insulation around pipe section (meters)     *
  W=0.057515*2. !Width of steel section (meters)           *
  ks=33.0   !Thermal Conductivity of the steel (W/m*K)          *
  x=500   !Lines of data in the files being read into program          *
  !q_ins_o:  The heat flux at the outer surface of the insulation       *
  !q_st_i:  The heat flux at the inner surface of the steel pipe      *
  !q_st_o:  The heat flux at the outer surface of the steel pipe      *
  !h_ins:   Heat transfer coefficient off of the outer surface of the insulation  *
  !h_st:   Heat transfer coefficient off of the inner surface of the steel pipe  *
  !R:    Resisatnce between the steel pipe and the heat blanket      *
  !*********************************************************************************************

  !!!!
```

```
    !Saves Temperature data to an array called "arr1".
    Open (unit= 13, File = File_read2, Status = 'Old', Action = 'Read', IOSTAT = status)
       Allocate ( arr2(x,7), Stat=status2)
    ! Reads file input by user and stores the array in arr1
       If (Status1 == 0) Then !status check
         Do i = 1,x
          read(13,*,IOSTAT = ierror2) (arr2(i,j),j = 1,7)
         End Do
       End if
    Close (Unit = 13)

    !!!!
```

```
    !Opens data file and reads Temperature data files using new variable x as the size of the ar
>>ray for how many lines of data ther are.
    !Saves Temperature data to an array called "arr1".
    Open (unit= 13, File = File_read2, Status = 'Old', Action = 'Read', IOSTAT = status)
       Allocate ( arr2(x,7), Stat=status2)
    ! Reads file input by user and stores the array in arr1
       If (Status1 == 0) Then !status check
         Do i = 1,x
          read(13,*,IOSTAT = ierror2) (arr2(i,j),j = 1,7)
         End Do
       End if
    Close (Unit = 13)
    !!!!
```

```
    !Saves Temperature data to an array called "arr1".
    Open (unit= 13, File = File_read2, Status = 'Old', Action = 'Read', IOSTAT = status)
       Allocate ( arr2(x,7), Stat=status2)
    ! Reads file input by user and stores the array in arr1
       If (Status1 == 0) Then !status check
         Do i = 1,x
          read(13,*,IOSTAT = ierror2) (arr2(i,j),j = 1,7)
         End Do
       End if
    Close (Unit = 13)
    !!!!
```

F:\Thesis stuff\THESIS DATA\Grade 91 program and data\Heat transfer in Grade 91 Steel.f95

```
          arr3(j,i) = arr1(j,i) + (Httemp-830)*((arr2(j-47,i) - arr1(j,i))/(1031 - 830))
          HBT(j) =  arr4(j,9) + (Httemp-830)*((arr5(j-47,9) - arr4(j,9))/(1031. - 830))
        End If



    Else If (Httemp >= 1028 .and. Httemp < 1133) then
        If (j < 310) then
          arr3(j,i) = arr1(j,i) + (Httemp-1031)*((arr2(j,i) - arr1(j,i))/(1133 - 1031))
          HBT(j) =  arr4(j,9) + (Httemp-1031.)*((arr5(j,9) - arr4(j,9))/(1133 - 1031.))
        Else If (j >=310 .and. j < 335) then
          count = count +1
          arr3(j,i) = arr1(j,i) + (Httemp-1031)*((arr2(j-count,i) - arr1(j,i))/(1133 - 1031))
          HBT(j) =  arr4(j,9) + (Httemp-1031.)*((arr5(j-count,9) - arr4(j,9))/(1133 - 1031.))
        Else
          arr3(j,i) = arr1(j,i) + (Httemp-1031)*((arr2(j-25,i) - arr1(j,i))/(1133 - 1031))
          HBT(j) =  arr4(j,9) + (Httemp-1031.)*((arr5(j-25,9) - arr4(j,9))/(1133 - 1031.))
        End If

    Else If (Httemp >= 1133 .and. Httemp <= 1477) then
        If (j < 298) then
          arr3(j,i) = arr1(j,i) + (Httemp-1133)*((arr2(j,i) - arr1(j,i))/(1477 - 1133))
          HBT(j) =  arr4(j,9) + (Httemp-1133)*((arr5(j,9) - arr4(j,9))/(1477 - 1133))
        Else If (j >=298 .and. j < 310) then
          count = count +1
          arr3(j,i) = arr1(j,i) + (Httemp-1133)*((arr2(j-count,i) - arr1(j,i))/(1477 - 1133))
          HBT(j) =  arr4(j,9) + (Httemp-1133)*((arr5(j-count,9) - arr4(j,9))/(1477 - 1133))
        Else
          arr3(j,i) = arr1(j,i) + (Httemp-1133)*((arr2(j-12,i) - arr1(j,i))/(1477 - 1133))
          HBT(j) =  arr4(j,9) + (Httemp-1133)*((arr5(j-12,9) - arr4(j,9))/(1477 - 1133))
        End If

    End If
  End Do
End Do



  !_____________________________________________________!
>>_____________________________________________________!
  !!!!
```

F:\Thesis stuff\THESIS DATA\Grade 91 program and data\Heat transfer in Grade 91 Steel.f95

```
      Else if (Tave <= 982) then
       ki = 0.27 + (0.35 - 0.27)*((Tave - 816.0)/(982.0-816.0))
      Else if (Tave <= 1093) then
       ki = 0.35 + (0.41 - 0.35)*((Tave - 982.0)/(1093.0-982.0))
      Else
         ki = 0.41
      End IF


      OIT(i) = Tinf + arr3(i,2)/arr3(i,3) !arr3(i,2) = q_ins_o ; arr3(i,3) = h_ins
   OPT(i) = HBT(i)- arr3(i,4)*arr3(i,7) !arr3(i,4) = R ; arr3(i,7) = q_st_o
      IPT(i) = OPT(i)- arr3(i,5)*Ri*log(Ro/Ri)/ks !arr3(i,5) = q_st_i
      AIPT(i) =  IPT(i)- arr3(i,5)/arr3(i,6) !arr3(i,5) = q_st_i ; arr3(i,6) = h_st

  End Do

  !_____________________________________________________________________________________________________
>>_____________________________________________!
  !!!!
```

```
    !!!!
```

```
    !Saves Temperature data to an array called "arr4".
    Open (unit= 14, File = File_read3, Status = 'Old', Action = 'Read', IOSTAT = status)
    ! Reads file input by user and stores the array in arr1
       If (Status1 == 0) Then !status check
         Do i = 1,x
          read(14,*,IOSTAT = ierror3) (arr4(i,j),j = 1,9)
         End Do
       End if
    Close (Unit = 14)

      !Opens data file and reads data file using new variable x as the size of the array for how
>> many lines of data ther are.
    !Saves Temperature data to an array called "arr5".
    Open (unit= 15, File = File_read4, Status = 'Old', Action = 'Read', IOSTAT = status)
    ! Reads file input by user and stores the array in arr1
       If (Status1 == 0) Then !status check
         Do i = 1,x
          read(15,*,IOSTAT = ierror4) (arr5(i,j),j = 1,9)
         End Do
       End if
    Close (Unit = 15)
  Else If (Httemp >= 1133 .and. Httemp <= 1477) then
    File_read1 = '1200FRun3_Coefficients.txt'
    File_read2 = '1400FRun3_Coefficients.txt'
    File_read3 = '1200FRun3_Celsius_Copy.txt'
    File_read4 = '1400FRun3_Celsius_Copy.txt'
    !!!!
```

```
       End Do
      End if
    Close (Unit = 14)

      !Opens data file and reads data file using new variable x as the size of the array for how
>> many lines of data ther are.
    !Saves Temperature data to an array called "arr5".
    Open (unit= 15, File = File_read4, Status = 'Old', Action = 'Read', IOSTAT = status)
    ! Reads file input by user and stores the array in arr1
       If (Status1 == 0) Then !status check
         Do i = 1,x
          read(15,*,IOSTAT = ierror4) (arr5(i,j),j = 1,9)
         End Do
       End if
    Close (Unit = 15)
  Else
    Write(*,*)'Temperature entered does not fit in to the bounds of availiable data for analysis
>>.'
  End If

  !!!!
```

```
        Else If (j >=298 .and. j < 310) then
          count = count +1
          arr3(j,i) = arr1(j,i) + (Httemp-1133)*((arr2(j-count,i) - arr1(j,i))/(1477 - 1133))
          HBT(j) =  arr4(j,9) + (Httemp-1133)*((arr5(j-count,9) - arr4(j,9))/(1477 - 1133))
        Else
          arr3(j,i) = arr1(j,i) + (Httemp-1133)*((arr2(j-12,i) - arr1(j,i))/(1477 - 1133))
          HBT(j) =  arr4(j,9) + (Httemp-1133)*((arr5(j-12,9) - arr4(j,9))/(1477 - 1133))
        End If

    End If
  End Do
End Do



  !_____________________________________________________________________________________________________
>>_____________________________________________________!
  !!!!
```

```
    OPT(i) = (OPT(i)*9/5)+32
    IPT(i) = (IPT(i)*9/5)+32
    AIPT(i) = (AIPT(i)*9/5)+32
  End Do

  !_____________________________________________________________________________________________________
>>_____________________________________________________!
  !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
>>!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!


  Open (unit= 33, File = 'Tempout.txt', Status = 'unknown', Action = 'Write', IOSTAT = status)
  Write(*,*) 'A file was created with the calculated temperatures called Tempout.txt'
   If (status == 0) Then
     Write(33,180) 'Time','OIT','HBT','OPT','IPT','AIPT'
       180 Format(1x,a,6x,a,12x,a,12x,a,12x,a,12x,a)
     Do i = 1 , 500
       Write(33,190) i,OIT(i), HBT(i), OPT(i), IPT(i), AIPT(i)
         190 Format(I4,6F15.5)
     End Do

   Else
        Write (*,*) status
   End If
  Close (Unit = 33)


  End Program heat_transfer
```

APPENDIX B

800 F First Text File for Fortran Program

800FRun2_Celsius_Copy

0.00	29.48	29.42	29.87	29.08	28.93	29.17	29.29	29.38
1.00	29.46	29.42	29.87	29.08	29.00	29.16	29.26	29.38
2.00	29.53	29.44	29.91	29.08	28.94	29.16	29.27	30.33
3.00	30.32	29.97	29.94	29.43	29.01	29.29	29.59	42.44
4.00	32.21	31.52	30.05	30.74	29.01	29.92	30.90	59.71
5.00	34.86	33.93	30.51	32.96	29.02	31.34	33.07	73.91
6.00	38.09	36.97	31.49	35.86	29.03	33.22	35.77	85.10
7.00	41.64	40.38	32.87	39.17	29.02	35.38	38.76	93.93
8.00	45.38	44.03	34.57	42.74	29.03	37.67	41.94	101.13
9.00	49.26	47.84	36.36	46.50	29.06	40.12	45.29	107.23
10.00	53.16	51.69	38.01	50.32	29.04	42.62	48.72	112.46
11.00	57.06	55.57	39.73	54.17	29.04	44.97	52.23	117.11
12.00	60.99	59.47	41.29	58.05	29.08	47.39	55.82	121.38
13.00	64.84	63.31	42.74	61.89	29.11	49.81	59.39	125.32
14.00	68.67	67.12	44.02	65.69	29.08	52.29	62.96	129.01
15.00	72.48	70.93	45.23	69.49	29.10	54.36	66.56	132.58
16.00	76.21	74.67	46.29	73.23	29.09	56.58	70.09	135.99
17.00	79.92	78.37	47.34	76.93	29.13	58.64	73.64	139.29
18.00	83.63	82.07	48.34	80.62	29.16	60.78	77.22	142.58
19.00	87.27	85.71	49.12	84.27	29.18	62.98	80.74	145.78
20.00	90.87	89.31	49.91	87.87	29.15	64.92	84.25	148.93
21.00	94.48	92.93	50.81	91.48	29.19	67.03	87.78	152.08
22.00	98.04	96.48	51.45	95.04	29.19	68.76	91.27	155.16
23.00	101.56	100.01	52.15	98.56	29.21	70.56	94.74	158.20
24.00	105.08	103.53	52.57	102.09	29.22	72.68	98.22	161.26
25.00	108.54	107.01	53.28	105.58	29.22	74.12	101.64	164.27
26.00	111.99	110.46	54.07	109.03	29.20	75.82	105.08	167.26
27.00	115.44	113.92	54.84	112.49	29.20	77.84	108.49	170.27
28.00	118.87	117.33	55.54	115.89	29.21	79.18	111.93	173.27
29.00	122.26	120.72	56.23	119.28	29.21	81.29	115.28	176.26
30.00	125.66	124.13	56.93	122.69	29.19	82.71	118.66	179.27
31.00	129.02	127.49	57.70	126.06	29.22	84.22	122.04	182.25
32.00	132.34	130.83	58.04	129.40	29.20	85.67	125.36	185.23
33.00	135.67	134.17	58.83	132.73	29.19	87.35	128.68	188.23
34.00	138.94	137.46	59.35	136.02	29.18	89.00	131.98	191.17
35.00	142.21	140.72	59.94	139.29	29.23	90.81	135.25	194.11
36.00	145.49	144.00	60.49	142.56	29.23	92.76	138.51	197.05
37.00	148.72	147.23	61.06	145.80	29.26	94.66	141.78	199.96
38.00	151.91	150.43	61.24	149.01	29.32	95.69	144.99	202.83
39.00	155.07	153.62	62.13	152.20	29.31	97.51	148.17	205.71
40.00	158.21	156.75	62.69	155.33	29.31	99.36	151.31	208.56
41.00	161.30	159.87	63.31	158.45	29.24	101.14	154.41	211.41
42.00	164.43	162.98	64.04	161.55	29.27	102.90	157.54	214.29
43.00	167.52	166.05	64.93	164.62	29.24	104.56	160.64	217.13
44.00	170.57	169.10	65.51	167.67	29.28	106.19	163.68	219.97
45.00	173.62	172.16	65.62	170.72	29.28	107.29	166.70	222.81
46.00	176.64	175.19	66.37	173.75	29.31	109.51	169.71	225.62
47.00	179.63	178.19	67.11	176.76	29.31	112.28	172.67	228.42
48.00	182.67	181.21	67.73	179.77	29.31	112.85	175.73	231.22
49.00	185.62	184.16	68.31	182.71	29.31	114.79	178.64	233.96
50.00	188.55	187.10	68.94	185.66	29.33	116.22	181.56	236.71
51.00	191.51	190.04	69.44	188.59	29.31	118.04	184.50	239.46
52.00	194.43	192.95	70.08	191.49	29.32	119.92	187.41	242.19
53.00	197.28	195.83	70.64	194.37	29.33	121.51	190.22	244.88
54.00	200.19	198.71	71.11	197.26	29.31	123.59	193.12	247.60
55.00	203.02	201.55	71.73	200.09	29.36	125.55	195.92	250.27
56.00	205.81	204.35	72.16	202.91	29.37	127.01	198.73	252.92
57.00	208.66	207.16	73.03	205.70	29.39	129.09	201.57	255.58
58.00	211.41	209.92	73.58	208.46	29.37	130.91	204.30	258.19
59.00	214.18	212.67	74.15	211.20	29.38	132.00	207.07	260.79
60.00	216.93	215.41	74.62	213.94	29.38	133.95	209.77	263.38
61.00	219.65	218.13	74.81	216.66	29.38	134.69	212.47	265.93
62.00	222.29	220.81	75.42	219.33	29.39	136.58	215.07	268.46

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63.00	224.95	223.46	76.27	221.99	29.37	139.79	217.73	270.96
64.00	227.62	226.09	76.83	224.63	29.38	140.21	220.43	273.46
65.00	230.20	228.69	77.06	227.22	29.41	141.79	222.96	275.92
66.00	232.80	231.27	77.94	229.79	29.38	143.38	225.53	278.37
67.00	235.38	233.84	78.32	232.36	29.39	145.24	228.08	280.82
68.00	237.91	236.37	79.01	234.91	29.37	147.80	230.61	283.21
69.00	240.39	238.88	79.36	237.41	29.35	148.63	233.06	285.58
70.00	242.89	241.37	79.67	239.89	29.39	150.39	235.53	287.97
71.00	245.34	243.82	80.34	242.36	29.42	151.98	238.00	290.31
72.00	247.82	246.26	80.81	244.78	29.46	153.48	240.48	292.64
73.00	250.23	248.69	81.68	247.21	29.47	155.52	242.84	294.96
74.00	252.62	251.07	81.92	249.60	29.49	156.67	245.24	297.24
75.00	255.01	253.43	82.44	251.94	29.46	158.71	247.59	299.49
76.00	257.38	255.79	82.84	254.32	29.49	160.61	249.95	301.77
77.00	259.72	258.14	83.33	256.66	29.48	161.32	252.29	304.02
78.00	262.03	260.44	83.99	258.95	29.44	164.88	254.53	306.22
79.00	264.27	262.69	84.62	261.21	29.48	164.75	256.76	308.41
80.00	266.53	264.93	85.27	263.45	29.46	166.85	259.03	310.57
81.00	268.76	267.16	85.61	265.68	29.48	167.83	261.24	312.73
82.00	270.96	269.36	85.90	267.87	29.49	169.73	263.43	314.84
83.00	273.14	271.52	86.26	270.03	29.48	172.02	265.54	316.95
84.00	275.32	273.69	86.75	272.21	29.53	173.42	267.75	319.07
85.00	277.45	275.82	87.37	274.33	29.54	174.96	269.84	321.13
86.00	279.56	277.92	87.93	276.42	29.51	176.03	271.95	323.16
87.00	281.66	280.02	88.38	278.52	29.56	177.85	274.02	325.20
88.00	283.73	282.08	89.00	280.58	29.54	179.81	276.08	327.20
89.00	285.78	284.12	89.15	282.62	29.54	179.03	278.12	329.19
90.00	287.81	286.14	89.51	284.64	29.58	181.18	280.13	331.16
91.00	289.84	288.17	90.32	286.67	29.56	185.53	282.14	333.13
92.00	291.83	290.16	90.72	288.66	29.59	183.43	284.14	335.06
93.00	293.79	292.12	91.11	290.62	29.59	187.58	286.02	336.97
94.00	295.74	294.04	91.69	292.53	29.59	188.42	287.95	338.85
95.00	297.64	295.94	91.57	294.44	29.61	187.53	289.91	340.72
96.00	299.57	297.84	92.41	296.36	29.63	189.41	291.83	342.57
97.00	301.43	299.72	92.87	298.22	29.61	191.56	293.63	344.38
98.00	303.28	301.56	93.61	300.06	29.62	193.51	295.42	346.18
99.00	305.13	303.39	93.73	301.89	29.60	195.59	297.24	347.96
100.00	306.94	305.20	94.39	303.69	29.59	195.62	299.08	349.73
101.00	308.74	306.98	94.55	305.49	29.62	195.22	300.91	351.47
102.00	310.52	308.76	94.93	307.26	29.63	195.85	302.58	353.20
103.00	312.27	310.51	95.06	308.99	29.64	198.37	304.32	354.89
104.00	314.01	312.24	95.59	310.73	29.64	199.80	306.07	356.58
105.00	315.73	313.95	96.09	312.44	29.66	202.94	307.74	358.26
106.00	317.42	315.62	96.41	314.11	29.68	203.97	309.42	359.91
107.00	319.07	317.29	97.03	315.78	29.67	204.76	311.04	361.53
108.00	320.76	318.94	97.49	317.44	29.68	206.54	312.79	363.18
109.00	322.42	320.57	97.60	319.06	29.73	208.04	314.41	364.81
110.00	324.02	322.18	98.38	320.67	29.70	208.47	315.98	366.38
111.00	325.61	323.78	98.80	322.28	29.69	210.21	317.60	367.94
112.00	327.20	325.36	98.83	323.83	29.74	211.96	319.12	369.49
113.00	328.78	326.92	98.87	325.39	29.76	212.54	320.69	371.02
114.00	330.34	328.47	99.02	326.95	29.74	212.59	322.26	372.55
115.00	331.86	329.99	99.74	328.47	29.73	214.53	323.74	374.06
116.00	333.38	331.49	100.26	329.97	29.76	217.13	325.24	375.54
117.00	334.89	332.99	100.69	331.47	29.79	216.13	326.75	377.02
118.00	336.38	334.48	100.83	332.95	29.80	218.73	328.21	378.47
119.00	337.85	335.94	100.92	334.42	29.83	216.99	329.69	379.92
120.00	339.31	337.39	101.61	335.86	29.81	220.31	331.09	381.36
121.00	340.75	338.82	102.08	337.30	29.78	222.14	332.54	382.77
122.00	342.16	340.23	102.52	338.71	29.77	222.64	333.92	384.15
123.00	343.57	341.64	103.17	340.12	29.77	223.68	335.33	385.55
124.00	344.96	343.01	102.77	341.49	29.77	224.44	336.71	386.93
125.00	346.32	344.37	103.49	342.85	29.79	226.48	338.08	388.29

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126.00	347.71	345.73	103.99	344.21	29.82	226.19	339.46	389.64
127.00	349.03	347.06	104.06	345.54	29.85	226.58	340.74	390.96
128.00	350.35	348.37	104.59	346.84	29.83	230.48	342.10	392.26
129.00	351.64	349.66	104.59	348.12	29.82	232.37	343.37	393.57
130.00	352.95	350.96	105.17	349.43	29.83	230.83	344.64	394.87
131.00	354.26	352.25	105.50	350.73	29.83	231.87	345.94	396.14
132.00	355.53	353.52	105.44	352.01	29.83	233.33	347.16	397.40
133.00	356.76	354.75	105.73	353.23	29.81	234.91	348.41	398.62
134.00	357.99	355.97	105.96	354.43	29.83	237.57	349.67	399.84
135.00	359.22	357.18	105.74	355.67	29.88	234.24	350.92	401.06
136.00	360.44	358.40	106.08	356.89	29.92	235.30	352.04	402.26
137.00	361.66	359.59	107.06	358.07	29.89	240.16	353.26	403.44
138.00	362.83	360.76	107.69	359.25	29.87	239.70	354.41	404.62
139.00	363.97	361.91	107.84	360.39	29.91	240.80	355.61	405.76
140.00	365.13	363.04	108.25	361.53	29.93	239.95	356.74	406.90
141.00	366.27	364.18	108.51	362.67	29.91	242.18	357.84	408.02
142.00	367.41	365.31	108.52	363.79	29.91	244.71	359.01	409.17
143.00	368.52	366.41	109.02	364.90	29.89	243.85	360.10	410.28
144.00	369.61	367.51	108.86	365.99	29.94	245.53	361.16	411.36
145.00	370.91	368.79	109.76	367.28	29.93	245.76	362.43	412.64
146.00	371.76	369.64	109.42	368.13	29.91	246.78	363.27	413.49
147.00	372.83	370.71	109.56	369.20	29.89	247.75	364.33	414.55
148.00	373.87	371.75	110.52	370.24	29.90	248.74	365.36	415.58
149.00	374.93	372.78	110.22	371.26	29.96	248.22	366.37	416.62
150.00	375.96	373.79	110.48	372.29	29.99	247.35	367.42	417.63
151.00	376.96	374.79	110.76	373.28	29.95	250.74	368.37	418.64
152.00	377.97	375.79	110.76	374.28	29.96	250.37	369.38	419.63
153.00	378.99	376.79	111.59	375.27	29.97	252.49	370.41	420.63
154.00	379.96	377.76	111.58	376.24	30.05	250.23	371.41	421.58
155.00	380.93	378.71	111.64	377.18	30.04	252.46	372.32	422.54
156.00	381.89	379.67	111.60	378.14	30.02	252.84	373.27	423.49
157.00	382.83	380.60	112.37	379.07	30.02	254.56	374.19	424.44
158.00	383.76	381.52	112.69	379.98	29.99	256.56	375.08	425.38
159.00	384.67	382.43	112.82	380.89	29.96	257.28	376.04	426.29
160.00	385.59	383.33	113.33	381.79	30.01	258.69	376.96	427.18
161.00	386.49	384.23	113.64	382.68	30.05	257.31	377.83	428.07
162.00	387.38	385.12	113.34	383.58	30.03	257.82	378.69	428.95
163.00	388.26	386.00	113.73	384.46	30.01	259.97	379.58	429.84
164.00	389.12	386.86	113.99	385.32	30.03	261.67	380.48	430.69
165.00	389.99	387.71	114.11	386.17	30.06	261.02	381.35	431.52
166.00	390.81	388.53	114.42	386.99	30.07	262.72	382.17	432.35
167.00	391.63	389.35	114.29	387.82	30.07	264.19	383.04	433.18
168.00	392.47	390.18	114.71	388.66	30.04	264.45	383.81	433.99
169.00	393.27	390.99	114.88	389.47	30.08	264.17	384.61	434.80
170.00	394.11	391.81	115.02	390.29	30.12	262.49	385.43	435.59
171.00	394.90	392.60	115.09	391.08	30.14	263.74	386.22	436.37
172.00	395.69	393.37	115.38	391.85	30.13	266.42	387.02	437.13
173.00	396.46	394.14	115.58	392.63	30.12	266.07	387.74	437.90
174.00	397.23	394.91	115.92	393.39	30.18	269.01	388.58	438.66
175.00	397.96	395.64	116.17	394.13	30.18	267.09	389.30	439.39
176.00	398.69	396.37	116.32	394.86	30.17	268.89	390.02	440.12
177.00	399.42	397.10	116.72	395.58	30.17	268.48	390.72	440.83
178.00	400.17	397.82	116.99	396.30	30.14	270.82	391.55	441.55
179.00	400.88	398.54	117.15	397.03	30.15	269.28	392.21	442.26
180.00	401.60	399.25	117.01	397.73	30.18	272.71	392.92	442.96
181.00	402.28	399.94	117.30	398.43	30.16	272.18	393.54	443.62
182.00	402.97	400.62	117.77	399.11	30.19	273.64	394.24	444.30
183.00	403.65	401.28	117.45	399.76	30.19	273.69	394.98	444.97
184.00	404.30	401.94	117.80	400.43	30.16	275.42	395.67	445.62
185.00	404.97	402.60	118.09	401.09	30.18	273.49	396.26	446.26
186.00	405.61	403.26	118.46	401.74	30.21	274.43	396.93	446.90
187.00	406.29	403.91	118.54	402.39	30.25	274.56	397.59	447.55
188.00	406.91	404.53	117.98	403.02	30.25	276.60	398.24	448.18

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189.00	407.55	405.15	118.35	403.63	30.27	278.30	398.92	448.81
190.00	408.17	405.77	118.64	404.27	30.26	277.83	399.53	449.42
191.00	408.79	406.38	119.04	404.87	30.26	278.04	400.14	450.02
192.00	409.36	406.97	119.22	405.47	30.28	280.19	400.76	450.61
193.00	409.98	407.57	118.92	406.07	30.29	280.47	401.33	451.21
194.00	410.57	408.16	119.33	406.67	30.31	279.29	401.92	451.81
195.00	411.17	408.74	119.44	407.24	30.24	278.92	402.53	452.37
196.00	411.76	409.32	119.35	407.83	30.32	278.72	403.08	452.94
197.00	412.32	409.88	119.68	408.38	30.33	282.10	403.64	453.50
198.00	412.90	410.45	120.13	408.95	30.33	280.53	404.20	454.07
199.00	413.43	410.99	120.12	409.50	30.28	281.23	404.75	454.63
200.00	414.01	411.54	120.16	410.03	30.35	281.60	405.32	455.18
201.00	414.54	412.07	120.39	410.57	30.32	282.81	405.92	455.71
202.00	415.07	412.60	120.90	411.10	30.34	283.83	406.39	456.21
203.00	415.59	413.12	120.91	411.61	30.37	285.12	406.95	456.73
204.00	416.10	413.64	120.94	412.14	30.36	285.33	407.44	457.25
205.00	416.62	414.14	120.98	412.64	30.36	284.69	407.96	457.74
206.00	417.13	414.64	121.17	413.15	30.36	283.62	408.43	458.24
207.00	417.63	415.15	121.42	413.65	30.41	283.06	408.91	458.74
208.00	418.09	415.62	121.75	414.09	30.35	288.36	409.47	459.23
209.00	418.60	416.11	121.94	414.60	30.39	287.19	409.95	459.71
210.00	419.05	416.59	121.71	415.08	30.41	286.06	410.29	460.19
211.00	419.58	417.08	121.75	415.56	30.42	286.69	410.88	460.67
212.00	420.07	417.54	122.14	416.04	30.38	287.23	411.38	461.13
213.00	420.51	417.99	122.03	416.51	30.42	288.83	411.88	461.58
214.00	420.93	418.43	122.44	416.95	30.41	289.81	412.33	462.04
215.00	421.36	418.88	122.57	417.38	30.41	289.21	412.67	462.48
216.00	421.87	419.32	122.03	417.80	30.43	291.40	413.24	462.94
217.00	422.28	419.74	121.89	418.24	30.45	290.32	413.76	463.38
218.00	422.68	420.18	122.59	418.70	30.46	288.18	414.07	463.81
219.00	423.14	420.61	122.82	419.09	30.46	290.42	414.49	464.24
220.00	423.60	421.03	122.69	419.51	30.46	291.12	414.97	464.68
221.00	424.02	421.44	122.95	419.96	30.46	291.62	415.46	465.09
222.00	424.42	421.86	122.92	420.38	30.41	291.07	415.81	465.48
223.00	424.81	422.27	123.21	420.77	30.48	292.57	416.14	465.89
224.00	425.23	422.67	123.92	421.16	30.47	292.22	416.54	466.28
225.00	425.63	423.07	123.32	421.56	30.47	291.74	416.94	466.67
226.00	426.04	423.47	123.05	421.97	30.48	292.06	417.35	467.07
227.00	426.46	423.87	123.48	422.36	30.46	293.41	417.79	467.46
228.00	426.82	424.22	123.59	422.72	30.46	294.18	418.21	467.83
229.00	427.19	424.59	123.53	423.09	30.47	292.95	418.56	468.19
230.00	427.56	424.96	123.57	423.44	30.50	296.26	418.96	468.56
231.00	427.89	425.31	123.83	423.81	30.52	293.94	419.26	468.94
232.00	428.28	425.68	124.70	424.19	30.49	294.59	419.69	469.28
233.00	428.61	426.02	124.55	424.54	30.54	293.70	419.96	469.63
234.00	428.99	426.38	124.30	424.89	30.57	293.93	420.35	470.00
235.00	429.37	426.72	124.09	425.23	30.53	294.97	420.76	470.35
236.00	429.69	427.06	124.49	425.56	30.47	295.50	421.06	470.71
237.00	429.99	427.39	124.28	425.90	30.53	296.56	421.37	471.04
238.00	430.36	427.72	124.74	426.23	30.54	297.17	421.77	471.38
239.00	430.67	428.06	124.83	426.58	30.55	295.09	422.09	471.72
240.00	431.01	428.39	124.62	426.91	30.55	296.38	422.39	472.05
241.00	431.34	428.71	124.90	427.23	30.49	296.64	422.80	472.37
242.00	431.67	429.04	124.88	427.57	30.55	296.62	423.06	472.68
243.00	431.98	429.36	124.73	427.88	30.52	298.03	423.37	473.01
244.00	432.28	429.66	125.34	428.16	30.57	298.33	423.67	473.32
245.00	432.59	429.96	125.51	428.47	30.57	297.68	423.97	473.63
246.00	432.87	430.26	125.63	428.78	30.54	299.45	424.31	473.93
247.00	433.21	430.56	125.57	429.07	30.58	297.98	424.59	474.22
248.00	433.51	430.85	125.79	429.37	30.57	298.54	424.92	474.50
249.00	433.78	431.14	125.57	429.66	30.60	299.83	425.16	474.78
250.00	434.11	431.44	125.71	429.97	30.62	296.96	425.50	475.06
251.00	434.33	431.71	125.30	430.20	30.56	300.26	425.72	475.34

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252.00	434.66	431.98	125.83	430.46	30.59	299.89	426.05	475.61
253.00	434.88	432.24	125.67	430.73	30.56	301.12	426.31	475.87
254.00	435.12	432.51	126.37	431.02	30.58	301.93	426.51	476.13
255.00	435.41	432.78	126.26	431.31	30.55	301.75	426.89	476.41
256.00	435.77	433.07	126.39	431.58	30.69	296.06	427.18	476.67
257.00	435.99	433.33	126.46	431.86	30.64	299.51	427.36	476.92
258.00	436.29	433.59	125.72	432.12	30.61	296.38	427.67	477.17
259.00	436.57	433.85	125.83	432.36	30.66	299.91	427.93	477.42
260.00	436.78	434.11	125.88	432.64	30.72	296.98	428.14	477.66
261.00	437.07	434.33	126.12	432.84	30.65	302.31	428.39	477.90
262.00	437.25	434.57	126.40	433.07	30.64	300.63	428.57	478.13
263.00	437.49	434.78	127.01	433.29	30.67	301.91	428.86	478.36
264.00	437.76	435.01	126.39	433.53	30.72	301.46	429.16	478.58
265.00	437.96	435.23	126.35	433.77	30.69	301.78	429.37	478.79
266.00	438.16	435.45	126.79	434.02	30.72	300.97	429.62	479.01
267.00	438.34	435.68	126.99	434.25	30.72	299.31	429.73	479.22
268.00	438.60	435.90	126.93	434.44	30.72	301.95	429.95	479.44
269.00	438.86	436.12	126.49	434.66	30.70	298.72	430.28	479.66
270.00	439.11	436.34	126.53	434.87	30.71	301.81	430.49	479.88
271.00	439.31	436.56	127.01	435.08	30.74	303.94	430.74	480.11
272.00	439.50	436.76	126.91	435.33	30.69	304.10	430.93	480.32
273.00	439.69	436.97	127.21	435.54	30.72	304.86	431.19	480.52
274.00	439.83	437.16	127.51	435.74	30.71	305.40	431.25	480.71
275.00	440.00	437.35	127.39	435.94	30.72	306.86	431.51	480.91
276.00	440.18	437.53	127.12	436.11	30.75	305.62	431.68	481.10
277.00	440.41	437.72	127.09	436.28	30.73	306.38	431.94	481.29
278.00	440.63	437.92	127.18	436.53	30.75	306.14	432.22	481.48
279.00	440.76	438.11	127.57	436.73	30.71	306.54	432.36	481.67
280.00	441.01	438.29	127.42	436.91	30.74	304.26	432.55	481.86
281.00	441.17	438.49	127.01	437.09	30.74	304.69	432.69	482.05
282.00	441.34	438.68	127.33	437.33	30.73	303.50	432.91	482.23
283.00	441.57	438.87	127.49	437.50	30.71	302.04	433.08	482.41
284.00	441.74	439.07	127.89	437.72	30.64	305.14	433.28	482.61
285.00	441.94	439.24	127.99	437.87	30.74	302.97	433.41	482.81
286.00	442.15	439.43	127.84	438.07	30.76	298.47	433.66	482.98
287.00	442.31	439.61	127.89	438.24	30.70	304.19	433.69	483.16
288.00	442.48	439.77	127.71	438.39	30.72	307.33	433.94	483.34
289.00	442.63	439.96	127.91	438.60	30.75	302.49	434.15	483.52
290.00	442.79	440.12	128.10	438.77	30.84	304.10	434.24	483.68
291.00	442.96	440.28	128.31	438.92	30.83	303.29	434.40	483.85
292.00	443.13	440.44	127.92	439.10	30.74	304.21	434.69	484.01
293.00	443.27	440.60	127.33	439.23	30.74	307.54	434.78	484.16
294.00	443.43	440.74	127.72	439.39	30.77	304.05	435.03	484.31
295.00	443.64	440.89	128.54	439.52	30.82	306.36	435.21	484.45
296.00	443.77	441.03	128.54	439.64	30.79	308.32	435.31	484.60
297.00	443.88	441.18	128.04	439.80	30.82	304.74	435.37	484.74
298.00	444.05	441.33	127.71	439.97	30.82	306.36	435.60	484.89
299.00	444.20	441.48	128.13	440.12	30.82	308.27	435.75	485.05
300.00	444.36	441.62	128.17	440.27	30.82	308.13	435.92	485.21
301.00	444.44	441.76	128.22	440.38	30.83	309.17	436.03	485.36
302.00	444.62	441.91	128.57	440.53	30.85	307.08	436.15	485.51
303.00	444.78	442.03	128.14	440.63	30.80	309.01	436.28	485.64
304.00	444.96	442.18	128.77	440.78	30.87	306.54	436.47	485.77
305.00	445.04	442.32	128.85	440.92	30.84	307.82	436.49	485.91
306.00	445.19	442.44	128.93	441.03	30.84	308.62	436.64	486.04
307.00	445.34	442.57	129.00	441.18	30.85	310.58	436.92	486.19
308.00	445.46	442.72	128.93	441.33	30.87	305.53	437.01	486.32
309.00	445.62	442.86	129.38	441.48	30.90	307.08	437.17	486.45
310.00	445.80	442.99	128.43	441.59	30.89	307.61	437.39	486.58
311.00	445.86	443.12	128.69	441.75	30.92	308.49	437.41	486.72
312.00	446.00	443.23	129.01	441.84	30.92	308.32	437.54	486.84
313.00	446.11	443.36	128.92	441.99	30.89	307.28	437.68	486.97
314.00	446.23	443.47	128.69	442.08	30.83	306.97	437.80	487.09

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315.00	446.37	443.60	128.83	442.22	30.81	309.16	437.97	487.23
316.00	446.49	443.71	129.01	442.31	30.81	310.39	438.07	487.37
317.00	446.59	443.83	128.85	442.43	30.82	307.73	438.19	487.48
318.00	446.74	443.94	128.56	442.55	30.85	310.18	438.32	487.61
319.00	446.86	444.06	128.34	442.66	30.86	307.89	438.49	487.73
320.00	447.02	444.20	128.10	442.80	30.90	304.43	438.61	487.85
321.00	447.16	444.32	128.98	442.88	30.86	310.99	438.69	487.98
322.00	447.28	444.42	128.36	443.01	30.86	311.65	438.89	488.09
323.00	447.34	444.52	129.22	443.12	30.90	309.87	438.88	488.19
324.00	447.44	444.63	129.13	443.23	30.92	312.58	439.03	488.29
325.00	447.55	444.73	129.33	443.33	30.84	309.31	439.08	488.38
326.00	447.66	444.85	128.96	443.44	30.85	310.29	439.23	488.49
327.00	447.76	444.96	129.57	443.58	30.91	307.16	439.34	488.60
328.00	447.89	445.08	129.07	443.70	30.92	307.87	439.47	488.73
329.00	448.01	445.17	129.21	443.78	30.90	309.33	439.57	488.84
330.00	448.11	445.29	128.88	443.89	30.96	305.89	439.66	488.94
331.00	448.19	445.38	129.16	443.99	30.88	311.72	439.77	489.04
332.00	448.29	445.47	128.79	444.09	30.91	309.88	439.89	489.14
333.00	448.39	445.57	129.17	444.18	30.89	309.28	439.91	489.22
334.00	448.49	445.67	129.47	444.29	30.90	310.49	440.08	489.32
335.00	448.57	445.76	129.28	444.38	30.89	310.72	440.23	489.41
336.00	448.70	445.83	129.73	444.42	30.93	312.03	440.34	489.52
337.00	448.73	445.93	129.68	444.56	30.89	310.71	440.32	489.61
338.00	448.84	446.03	129.44	444.63	30.92	309.76	440.42	489.69
339.00	448.92	446.12	129.51	444.74	30.93	310.85	440.53	489.77
340.00	449.05	446.23	129.80	444.84	30.91	312.28	440.61	489.86
341.00	449.10	446.31	129.68	444.91	30.91	311.76	440.74	489.96
342.00	449.22	446.40	129.88	445.02	30.93	309.83	440.83	490.03
343.00	449.27	446.48	129.67	445.08	30.91	311.94	440.82	490.13
344.00	449.42	446.57	130.02	445.17	30.93	310.27	440.99	490.23
345.00	449.44	446.65	130.17	445.28	30.95	312.07	441.02	490.34
346.00	449.53	446.72	130.02	445.32	30.92	314.73	441.17	490.43
347.00	449.61	446.79	129.76	445.40	30.98	314.17	441.28	490.52
348.00	449.69	446.88	130.01	445.52	31.06	313.50	441.32	490.58
349.00	449.75	446.95	130.38	445.56	30.99	315.77	441.39	490.66
350.00	449.83	447.02	129.81	445.66	30.90	312.84	441.43	490.72
351.00	449.92	447.11	130.01	445.77	30.88	313.68	441.51	490.78
352.00	449.99	447.19	129.72	445.89	30.98	313.97	441.53	490.83
353.00	450.08	447.28	129.47	445.99	31.04	311.25	441.54	490.88
354.00	450.19	447.37	130.27	446.08	30.99	311.16	441.71	490.96
355.00	450.30	447.46	129.60	446.17	31.09	313.17	441.82	491.03
356.00	450.33	447.54	129.77	446.24	31.06	313.57	441.72	491.10
357.00	450.40	447.59	129.74	446.26	30.98	317.70	442.04	491.19
358.00	450.33	447.64	129.20	446.29	30.81	318.94	442.02	491.26
359.00	450.44	447.71	129.58	446.36	30.74	316.87	442.05	491.32
360.00	450.59	447.79	129.86	446.47	30.84	315.76	442.26	491.39
361.00	450.64	447.87	130.33	446.59	30.84	315.03	442.24	491.45
362.00	450.70	447.95	129.93	446.70	30.99	313.74	442.22	491.51
363.00	450.79	448.04	130.06	446.81	31.03	313.41	442.30	491.57
364.00	450.88	448.09	129.97	446.83	30.94	315.19	442.52	491.66
365.00	450.92	448.14	129.99	446.91	30.99	314.49	442.56	491.73
366.00	450.99	448.19	130.11	446.99	31.09	314.46	442.64	491.79
367.00	451.04	448.26	130.57	447.07	31.06	314.84	442.68	491.84
368.00	451.04	448.33	130.67	447.16	31.05	313.96	442.56	491.88
369.00	451.10	448.39	130.92	447.25	31.09	312.33	442.62	491.93
370.00	451.17	448.43	130.53	447.27	31.06	313.63	442.67	491.98
371.00	451.26	448.49	130.13	447.31	31.08	314.62	442.79	492.04
372.00	451.26	448.52	130.50	447.34	30.98	315.48	442.86	492.10
373.00	451.31	448.58	130.59	447.42	31.11	314.99	442.88	492.15
374.00	451.44	448.66	130.81	447.51	31.17	314.95	443.07	492.21
375.00	451.46	448.71	131.37	447.56	31.06	315.69	443.04	492.26
376.00	451.55	448.78	130.95	447.64	31.07	316.47	443.11	492.30
377.00	451.56	448.86	131.21	447.74	31.12	315.86	443.08	492.37

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378.00	451.63	448.92	130.69	447.76	31.12	314.13	443.11	492.44
379.00	451.74	448.97	130.41	447.81	31.06	313.93	443.22	492.51
380.00	451.87	449.04	129.41	447.88	31.06	308.36	443.42	492.57
381.00	451.73	449.04	130.61	447.88	30.97	313.11	443.39	491.54
382.00	450.77	448.71	118.99	447.03	30.83	272.34	436.89	481.21
383.00	448.38	446.91	110.39	444.93	30.88	256.99	433.87	468.86
384.00	445.16	443.98	105.30	441.92	30.72	244.92	430.44	458.33
385.00	441.52	440.57	101.36	438.53	30.63	244.17	427.27	449.79
386.00	437.68	436.95	97.98	434.97	30.52	244.74	424.36	442.73
387.00	433.83	433.18	96.59	431.20	30.46	239.70	420.98	436.59
388.00	429.92	429.37	95.63	427.39	30.40	236.94	417.21	431.21
389.00	426.02	425.52	94.01	423.56	30.36	233.22	413.79	426.22
390.00	422.12	421.68	91.46	419.74	30.33	230.36	409.60	421.63
391.00	418.32	417.90	89.89	416.03	30.27	230.96	407.39	417.33
392.00	414.58	414.18	88.04	412.29	30.19	224.79	402.96	413.17
393.00	410.76	410.42	86.41	408.52	30.23	222.54	399.62	409.14
394.00	407.06	406.71	86.24	404.82	30.21	217.49	395.38	405.23
395.00	403.36	403.04	84.60	401.22	30.18	219.78	392.87	401.38
396.00	399.77	399.46	83.94	397.63	30.17	215.96	388.49	397.60
397.00	396.17	395.87	84.27	394.04	30.17	212.46	385.98	393.92
398.00	392.61	392.34	84.04	390.54	30.16	207.10	381.76	390.27
399.00	389.08	388.81	82.59	386.97	30.11	203.69	377.91	386.61
400.00	385.56	385.32	80.57	383.54	30.14	204.68	376.02	383.10
401.00	382.19	381.98	80.68	380.30	30.18	206.06	372.94	379.61
402.00	378.89	378.66	79.28	376.93	30.17	199.36	369.09	376.16
403.00	375.57	375.35	78.74	373.65	30.08	197.10	365.81	372.78
404.00	372.28	372.07	78.38	370.36	30.07	192.81	362.73	369.37
405.00	368.99	368.80	78.80	367.11	29.99	193.46	359.57	365.95
406.00	365.81	365.61	76.99	363.84	30.06	186.89	355.29	362.76
407.00	362.57	362.41	76.06	360.72	30.01	187.03	352.93	359.57
408.00	359.37	359.19	76.52	357.48	30.08	185.63	350.22	356.34
409.00	356.21	356.04	76.65	354.28	29.91	177.46	345.91	353.07
410.00	353.02	352.88	76.03	351.16	29.89	176.56	343.32	349.89
411.00	349.90	349.76	75.47	348.07	29.87	174.66	340.62	346.67
412.00	346.90	346.78	75.32	345.12	29.79	174.93	338.26	343.62
413.00	343.93	343.82	73.73	342.15	29.86	170.68	334.32	340.66
414.00	340.93	340.81	72.94	339.10	29.76	170.51	331.56	337.66
415.00	337.94	337.83	72.03	336.08	29.73	162.31	328.23	334.66
416.00	335.04	334.92	71.69	333.27	29.79	163.86	326.26	331.75
417.00	332.08	331.98	71.88	330.30	29.73	162.62	322.79	328.81
418.00	329.21	329.13	71.54	327.58	29.78	164.22	321.44	325.92
419.00	326.47	326.41	70.62	324.87	29.73	164.37	318.80	323.11
420.00	323.78	323.73	70.56	322.30	29.71	166.42	317.33	320.33
421.00	321.21	321.15	69.16	319.71	29.81	163.13	313.79	317.70
422.00	318.58	318.54	68.71	317.07	29.84	160.49	311.09	315.08
423.00	315.91	315.87	68.53	314.41	29.84	160.08	308.89	312.44
424.00	313.36	313.32	67.23	311.90	29.88	159.55	306.16	309.87
425.00	310.80	310.75	66.66	309.32	29.94	156.68	303.60	307.31
426.00	308.23	308.22	65.93	306.84	29.92	155.14	301.74	304.74
427.00	305.78	305.74	65.68	304.38	29.97	154.55	299.18	302.23
428.00	303.31	303.27	65.01	301.89	29.94	153.95	296.65	299.76
429.00	300.80	300.76	65.22	299.37	29.88	149.69	293.88	297.23
430.00	298.33	298.34	64.27	297.01	29.89	151.00	292.25	294.81
431.00	295.97	295.97	65.02	294.63	29.83	148.38	289.28	292.37
432.00	293.53	293.52	64.89	292.12	29.79	145.18	286.46	289.94
433.00	291.16	291.14	64.16	289.79	29.76	144.09	283.96	287.56
434.00	288.77	288.77	64.23	287.42	29.83	142.02	281.89	285.22
435.00	286.42	286.41	64.14	285.07	29.87	140.86	279.46	282.87
436.00	284.11	284.12	63.55	282.81	29.77	140.92	277.69	280.59
437.00	281.86	281.86	62.69	280.52	29.82	137.88	274.93	278.31
438.00	279.56	279.57	62.33	278.25	29.77	135.34	272.99	276.02
439.00	277.34	277.36	61.21	276.08	29.81	135.93	271.05	273.81
440.00	275.13	275.14	60.64	273.84	29.83	134.01	268.37	271.62

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441.00	272.89	272.92	60.07	271.63	29.82	133.22	266.22	269.43
442.00	270.71	270.72	59.43	269.46	29.82	133.02	264.54	267.26
443.00	268.53	268.54	60.31	267.28	29.86	131.49	262.42	265.09
444.00	266.40	266.41	60.71	265.17	29.82	128.34	259.91	262.94
445.00	264.24	264.26	59.22	263.00	29.81	127.05	257.67	260.83
446.00	262.13	262.14	59.22	260.93	29.82	127.61	255.88	258.73
447.00	260.06	260.08	59.00	258.86	29.79	125.85	253.43	256.62
448.00	257.95	257.97	58.86	256.71	29.73	124.24	251.24	254.50
449.00	255.89	255.90	58.59	254.68	29.84	122.97	249.47	252.46
450.00	253.86	253.88	57.93	252.68	29.73	121.87	247.92	250.44
451.00	251.84	251.86	57.38	250.66	29.71	121.99	245.35	248.41
452.00	249.85	249.86	57.59	248.63	29.66	117.37	243.36	246.41
453.00	247.83	247.85	57.09	246.65	29.72	118.43	241.81	244.47
454.00	245.85	245.86	56.57	244.68	29.75	119.16	239.71	242.49
455.00	243.88	243.91	56.58	242.72	29.72	115.78	237.55	240.53
456.00	241.96	241.98	55.33	240.81	29.76	116.35	235.93	238.64
457.00	240.07	240.07	55.17	238.93	29.80	116.08	234.19	236.74
458.00	238.17	238.18	55.93	237.02	29.69	113.65	231.95	234.83
459.00	236.28	236.30	55.54	235.14	29.67	111.24	229.94	232.88
460.00	234.38	234.39	54.51	233.23	29.64	111.04	228.40	231.04
461.00	232.54	232.54	54.29	231.38	29.64	109.77	225.84	229.21
462.00	230.66	230.66	53.97	229.49	29.64	108.27	224.02	227.36
463.00	228.81	228.82	54.07	227.68	29.61	106.81	222.57	225.52
464.00	227.00	227.01	53.13	225.85	29.62	106.18	220.33	223.74
465.00	225.21	225.21	53.14	224.09	29.57	106.54	219.38	221.97
466.00	223.40	223.42	52.77	222.30	29.53	104.73	217.09	220.21
467.00	221.66	221.66	53.19	220.54	29.55	100.24	215.36	218.37
468.00	219.91	219.92	53.11	218.79	29.57	98.91	213.81	216.58
469.00	218.16	218.17	52.27	217.09	29.55	103.08	212.62	214.88
470.00	216.47	216.47	52.61	215.39	29.48	102.33	210.83	213.23
471.00	214.78	214.79	51.85	213.72	29.58	100.92	209.10	211.56
472.00	213.10	213.10	51.75	212.01	29.57	100.37	206.72	209.93
473.00	211.41	211.40	51.31	210.32	29.65	100.55	205.25	208.27
474.00	209.77	209.76	50.83	208.68	29.64	98.80	203.74	206.64
475.00	208.11	208.08	50.29	207.02	29.63	97.92	202.36	205.00
476.00	206.49	206.49	49.82	205.47	29.62	97.77	200.92	203.42
477.00	204.88	204.86	49.96	203.81	29.66	95.96	198.82	201.82
478.00	203.25	203.24	49.90	202.21	29.64	95.30	197.53	200.23
479.00	201.68	201.65	50.13	200.60	29.62	93.21	195.36	198.61
480.00	200.10	200.08	49.53	199.07	29.61	94.12	194.36	197.02
481.00	198.53	198.50	49.21	197.47	29.67	92.28	192.57	195.46
482.00	196.95	196.92	49.06	195.87	29.60	91.42	190.66	193.92
483.00	195.38	195.34	48.68	194.31	29.60	91.11	189.54	192.38
484.00	193.82	193.78	47.87	192.77	29.63	90.79	187.84	190.83
485.00	192.27	192.23	47.89	191.18	29.62	88.19	185.91	189.28
486.00	190.72	190.68	48.04	189.66	29.66	88.52	184.70	187.73
487.00	189.22	189.17	47.43	188.18	29.66	88.17	183.31	186.25
488.00	187.73	187.69	47.70	186.69	29.61	86.85	181.79	184.72
489.00	186.29	186.23	48.02	185.26	29.53	85.90	180.65	183.24
490.00	184.80	184.77	46.96	183.79	29.57	85.77	179.34	181.78
491.00	183.36	183.33	46.97	182.39	29.57	85.95	177.72	180.38
492.00	181.94	181.91	46.43	180.93	29.53	84.97	175.93	178.94
493.00	180.54	180.49	46.24	179.56	29.54	85.58	175.26	177.58
494.00	179.13	179.09	46.37	178.15	29.53	83.88	173.57	176.18
495.00	177.75	177.70	46.73	176.76	29.47	82.26	171.88	174.75
496.00	176.36	176.31	46.04	175.37	29.52	81.29	170.84	173.37
497.00	175.00	174.95	45.51	174.05	29.43	80.97	169.99	172.03
498.00	173.68	173.64	45.93	172.77	29.50	81.89	168.81	170.72
499.00	172.36	172.31	46.38	171.41	29.47	78.97	167.02	169.34

APPENDIX C

800 F Second Text File for Fortran Program

800FRun2_Coefficients

0.0	-1.1853	-1.2624	-.00048	259.3195	2029.4567	194.9367
1.0	-1.2125	-1.3902	-.00038	290.7521	3078.5520	218.5654
2.0	1.0354	1.0711	0.00294	361.4756	3253.2806	271.7300
3.0	30.6673	32.8578	0.01567	1029.4198	3369.0100	773.8397
4.0	72.7377	69.6425	0.01981	1846.6690	1888.6387	1388.1857
5.0	106.4295	71.4825	0.02053	2530.3295	1464.4993	1902.1097
6.0	131.4565	53.4135	0.01904	3284.7135	1285.3226	2469.1983
7.0	149.7261	38.8899	0.01706	4078.3882	1207.4175	3065.8228
8.0	163.2273	29.4398	0.01525	4864.2049	1138.5655	3656.5401
9.0	173.8131	23.8281	0.01374	5610.7306	1083.6175	4217.7215
10.0	182.5732	20.3487	0.01258	6270.8166	1028.0027	4713.9241
11.0	189.7666	17.7629	0.01168	6836.6046	942.2579	5139.2405
12.0	196.3878	16.0827	0.01099	7308.0945	867.1437	5493.6709
13.0	202.5049	14.8597	0.01044	7708.8610	804.8694	5794.9367
14.0	208.4176	13.9513	0.00995	8070.3367	756.5940	6066.6667
15.0	214.2078	13.2819	0.00953	8384.6633	687.2675	6302.9536
16.0	219.9570	12.7841	0.00919	8651.8409	640.3500	6503.7975
17.0	225.5019	12.3827	0.00890	8879.7278	591.9818	6675.1055
18.0	231.0877	12.0463	0.00865	9068.3238	551.4521	6816.8777
19.0	237.0413	11.8917	0.00843	9233.3452	519.7005	6940.9283
20.0	242.8315	11.6965	0.00825	9366.9341	484.4966	7041.3502
21.0	248.3491	11.4888	0.00808	9484.8066	457.0991	7129.9578
22.0	254.3164	11.4242	0.00793	9579.1046	425.6329	7200.8439
23.0	260.0656	11.3373	0.00781	9641.9699	398.6115	7248.1013
24.0	266.5370	11.4149	0.00770	9704.8352	380.0022	7295.3587
25.0	272.1909	11.3125	0.00760	9751.9842	354.3313	7330.8017
26.0	277.5859	11.1630	0.00751	9783.4169	334.4123	7354.4304
27.0	283.0763	11.0409	0.00742	9830.5659	320.7944	7389.8734
28.0	288.7166	10.9662	0.00737	9822.7077	299.9300	7383.9663
29.0	294.3569	10.8954	0.00728	9861.9985	290.1536	7413.5021
30.0	299.9971	10.8150	0.00721	9893.4312	275.1572	7437.1308
31.0	305.4331	10.7232	0.00717	9869.8567	260.9539	7419.4093
32.0	311.9180	10.8159	0.00712	9877.7149	248.8786	7425.3165
33.0	317.3131	10.7040	0.00707	9885.5730	239.1671	7431.2236
34.0	323.2530	10.7156	0.00706	9846.2822	229.0721	7401.6878
35.0	329.0023	10.7109	0.00701	9846.2822	221.5690	7401.6878
36.0	334.8878	10.7145	0.00694	9877.7149	215.9325	7425.3165
37.0	340.6098	10.7110	0.00694	9822.7077	208.4763	7383.9663
38.0	347.2310	10.8793	0.00692	9783.4169	198.4689	7354.4304
39.0	352.0811	10.7251	0.00690	9759.8424	192.6285	7336.7089
40.0	357.7078	10.7152	0.00687	9751.9842	187.7186	7330.8017
41.0	363.1845	10.6610	0.00684	9744.1260	182.9310	7324.8945
42.0	368.4570	10.5963	0.00681	9744.1260	178.3187	7324.8945
43.0	373.2526	10.4601	0.00679	9720.5515	173.3233	7307.1730
44.0	378.7839	10.4556	0.00674	9744.1260	169.4958	7324.8945
45.0	385.4732	10.6077	0.00668	9791.2750	164.8054	7360.3376
46.0	390.5276	10.5358	0.00665	9799.1332	162.7763	7366.2447
47.0	395.5821	10.4667	0.00659	9846.2822	163.0479	7401.6878
48.0	400.9226	10.4362	0.00657	9822.7077	156.2191	7383.9663
49.0	406.2359	10.4178	0.00651	9877.7149	154.7019	7425.3165
50.0	411.4266	10.3866	0.00648	9885.5730	151.2841	7431.2236
51.0	416.9443	10.3890	0.00644	9909.1475	149.1094	7448.9452
52.0	422.0532	10.3543	0.00640	9924.8639	147.0592	7460.7595
53.0	427.2711	10.3428	0.00634	9987.7292	145.3583	7508.0169
54.0	432.8160	10.3558	0.00631	9995.5874	143.7639	7513.9241
55.0	437.8296	10.3329	0.00626	10042.7364	142.7088	7549.3671
56.0	443.2792	10.3610	0.00626	10011.3037	139.5736	7525.7384
57.0	447.6524	10.2581	0.00623	10027.0200	138.3461	7537.5528
58.0	452.7205	10.2400	0.00619	10050.5945	136.9394	7555.2743
59.0	457.6932	10.2240	0.00616	10058.4527	133.9936	7561.1815
60.0	462.8839	10.2307	0.00610	10129.1762	133.6009	7614.3460
61.0	468.6740	10.3169	0.00606	10160.6089	130.6457	7637.9747
62.0	473.3879	10.2848	0.00601	10223.4742	130.2630	7685.2321

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63.0	477.4341	10.1786	0.00599	10215.6160	131.0815	7679.3249
64.0	482.2025	10.1623	0.00600	10168.4670	126.7625	7643.8819
65.0	487.6656	10.2343	0.00594	10239.1905	126.1502	7697.0464
66.0	491.5076	10.1214	0.00590	10278.4813	125.1185	7726.5823
67.0	496.5893	10.1506	0.00585	10333.4885	124.7420	7767.9325
68.0	500.7718	10.0883	0.00584	10325.6303	124.6889	7762.0253
69.0	505.7309	10.1135	0.00579	10380.6375	122.9529	7803.3755
70.0	510.7989	10.1584	0.00576	10412.0702	122.2951	7827.0042
71.0	514.9133	10.1129	0.00576	10388.4957	120.7730	7809.2827
72.0	519.4773	10.1164	0.00574	10380.6375	119.3253	7803.3755
73.0	523.0332	10.0177	0.00569	10459.2192	119.7773	7862.4473
74.0	528.0195	10.0703	0.00569	10427.7865	117.7246	7838.8186
75.0	532.2701	10.0449	0.00565	10482.7937	117.9388	7880.1688
76.0	536.8886	10.0635	0.00562	10506.3682	117.5940	7897.8903
77.0	541.1937	10.0500	0.00561	10506.3682	115.4898	7897.8903
78.0	544.9676	9.9902	0.00554	10616.3825	118.4277	7980.5907
79.0	548.7822	9.9517	0.00553	10624.2407	115.4669	7986.4979
80.0	552.5152	9.8997	0.00553	10600.6662	114.9955	7968.7764
81.0	556.9565	9.9230	0.00550	10639.9570	113.9114	7998.3123
82.0	561.4388	9.9526	0.00548	10655.6733	113.7279	8010.1266
83.0	565.7303	9.9649	0.00542	10749.9713	114.9456	8081.0127
84.0	569.7221	9.9573	0.00543	10710.6805	113.5408	8051.4768
85.0	573.2507	9.9121	0.00540	10765.6876	113.4690	8092.8270
86.0	576.8610	9.8740	0.00539	10765.6876	112.2335	8092.8270
87.0	580.7574	9.8740	0.00536	10812.8366	112.4385	8128.2701
88.0	584.1361	9.8248	0.00535	10812.8366	112.3087	8128.2701
89.0	588.6456	9.8748	0.00533	10836.4111	109.3605	8145.9916
90.0	592.5829	9.8883	0.00531	10859.9856	109.7461	8163.7131
91.0	595.4303	9.7986	0.00529	10891.4183	112.7411	8187.3418
92.0	599.1905	9.8023	0.00528	10883.5601	108.0731	8181.4346
93.0	602.9234	9.8010	0.00523	10985.7163	111.5930	8258.2279
94.0	606.0978	9.7600	0.00521	11017.1490	110.6942	8281.8566
95.0	610.9751	9.8606	0.00523	10946.4255	106.9277	8228.6920
96.0	613.4546	9.7710	0.00523	10938.5673	106.7988	8222.7848
97.0	616.7925	9.7508	0.00517	11040.7235	108.1658	8299.5781
98.0	619.3810	9.6795	0.00514	11111.4470	109.0308	8352.7426
99.0	623.4409	9.7210	0.00511	11158.5960	109.7687	8388.1857
100.0	626.1657	9.6639	0.00511	11127.1633	107.5492	8364.5570
101.0	630.0485	9.7038	0.00513	11080.0143	104.8416	8329.1139
102.0	633.3455	9.6982	0.00506	11229.3195	105.2091	8441.3502
103.0	637.1874	9.7396	0.00504	11245.0358	106.1353	8453.1646
104.0	640.0348	9.7048	0.00505	11221.4613	105.5917	8435.4431
105.0	642.9094	9.6775	0.00501	11292.1848	107.7498	8488.6076
106.0	646.1791	9.6838	0.00499	11315.7593	107.3092	8506.3291
107.0	648.6450	9.6294	0.00497	11355.0501	106.8320	8535.8650
108.0	651.5333	9.6081	0.00501	11268.6103	106.0630	8470.8861
109.0	655.2662	9.6552	0.00498	11331.4756	106.5266	8518.1435
110.0	657.2281	9.5697	0.00496	11370.7664	105.7636	8547.6793
111.0	660.0210	9.5501	0.00497	11323.6174	105.4395	8512.2363
112.0	663.7403	9.6063	0.00492	11425.7736	106.6224	8589.0296
113.0	667.3915	9.6560	0.00492	11433.6318	105.7147	8594.9367
114.0	670.7838	9.6825	0.00491	11425.7736	104.1811	8589.0296
115.0	672.7048	9.6093	0.00489	11488.6389	105.1966	8636.2869
116.0	675.0617	9.5753	0.00487	11520.0716	106.5632	8659.9156
117.0	677.6366	9.5576	0.00487	11512.2134	104.0678	8654.0085
118.0	680.8654	9.5859	0.00484	11559.3624	105.5864	8689.4515
119.0	684.1760	9.6242	0.00485	11543.6461	102.4281	8677.6372
120.0	686.0289	9.5555	0.00481	11622.2278	104.9043	8736.7089
121.0	688.3177	9.5203	0.00482	11606.5114	105.1261	8724.8945
122.0	690.6337	9.4932	0.00479	11653.6604	104.7206	8760.3376
123.0	692.4866	9.4351	0.00480	11645.8023	104.3011	8754.4304
124.0	696.8462	9.5466	0.00478	11669.3768	103.9434	8772.1519
125.0	698.4130	9.4764	0.00479	11653.6604	104.4235	8760.3376

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126.0	700.5110	9.4444	0.00478	11661.5186	102.9513	8766.2448
127.0	703.5628	9.4806	0.00476	11724.3839	102.6953	8813.5021
128.0	705.4429	9.4353	0.00478	11669.3768	104.5487	8772.1519
129.0	708.6445	9.4774	0.00477	11700.8094	105.4127	8795.7806
130.0	710.4292	9.4305	0.00474	11755.8166	103.2923	8837.1308
131.0	712.7452	9.4188	0.00474	11763.6748	103.1248	8843.0380
132.0	715.9741	9.4692	0.00470	11842.2564	104.0417	8902.1097
133.0	718.2493	9.4610	0.00471	11810.8237	104.0550	8878.4810
134.0	720.6743	9.4666	0.00473	11779.3911	105.0793	8854.8523
135.0	724.1893	9.5463	0.00474	11747.9584	100.6920	8831.2237
136.0	726.3146	9.5359	0.00468	11889.4054	101.8461	8937.5528
137.0	726.8323	9.4197	0.00468	11889.4054	105.1229	8937.5528
138.0	728.1538	9.3566	0.00467	11905.1217	103.7835	8949.3671
139.0	730.5925	9.3746	0.00470	11818.6819	102.9402	8884.3882
140.0	732.3772	9.3508	0.00468	11865.8309	101.6007	8919.8312
141.0	734.5025	9.3448	0.00466	11920.8381	103.0669	8961.1815
142.0	737.2818	9.3782	0.00468	11873.6891	103.8818	8925.7384
143.0	738.7804	9.3372	0.00467	11905.1217	102.4096	8949.3671
144.0	742.1626	9.4044	0.00465	11952.2707	103.3635	8984.8102
145.0	746.4313	9.3505	0.00463	11991.5616	102.7750	9014.3460
146.0	750.1276	9.4349	0.00462	12007.2779	103.0766	9026.1604
147.0	754.2423	9.4675	0.00462	12015.1361	103.0605	9032.0675
148.0	757.4930	9.3962	0.00461	12038.7106	103.2283	9049.7891
149.0	761.9311	9.4932	0.00458	12109.4341	102.4920	9102.9536
150.0	765.7936	9.5143	0.00459	12078.0014	100.5941	9079.3249
151.0	769.5945	9.5234	0.00456	12148.7249	103.2860	9132.4895
152.0	773.6285	9.5746	0.00457	12140.8667	102.0098	9126.5823
153.0	776.9072	9.5190	0.00456	12140.8667	102.9614	9126.5823
154.0	780.7905	9.5770	0.00458	12085.8596	99.7320	9085.2321
155.0	784.6365	9.6156	0.00455	12172.2994	101.5487	9150.2110
156.0	788.5646	9.6658	0.00454	12188.0157	101.2013	9162.0253
157.0	791.7461	9.6138	0.00453	12219.4484	102.1408	9185.6540
158.0	795.2808	9.6171	0.00451	12274.4556	103.5576	9227.0042
159.0	798.9322	9.6418	0.00454	12203.7321	102.7587	9173.8397
160.0	802.1099	9.6266	0.00453	12203.7321	103.1883	9173.8397
161.0	805.4884	9.6357	0.00452	12243.0229	101.5831	9203.3756
162.0	809.4248	9.7157	0.00450	12298.0300	101.7487	9244.7258
163.0	812.7485	9.7077	0.00450	12282.3137	102.6854	9232.9114
164.0	816.0541	9.7194	0.00452	12227.3066	102.9138	9191.5612
165.0	819.4030	9.7490	0.00452	12219.4484	101.5513	9185.6540
166.0	822.5619	9.7518	0.00452	12227.3066	102.3634	9191.5612
167.0	826.1594	9.8093	0.00455	12156.5831	102.2899	9138.3967
168.0	829.1751	9.7934	0.00451	12243.0229	102.5713	9203.3756
169.0	832.4022	9.8167	0.00451	12258.7392	101.7886	9215.1899
170.0	835.5926	9.8421	0.00450	12274.4556	99.8419	9227.0042
171.0	838.8027	9.8734	0.00449	12282.3137	100.2820	9232.9114
172.0	841.7621	9.8740	0.00449	12274.4556	101.7782	9227.0042
173.0	844.8206	9.8861	0.00447	12329.4627	101.3334	9268.3545
174.0	847.7168	9.8878	0.00450	12235.1647	102.3197	9197.4684
175.0	850.5885	9.8918	0.00450	12250.8811	100.2481	9209.2827
176.0	853.5124	9.9073	0.00449	12274.4556	101.3348	9227.0042
177.0	856.1714	9.8916	0.00447	12313.7464	100.7397	9256.5401
178.0	858.9633	9.8896	0.00452	12188.0157	100.9545	9162.0253
179.0	861.8539	9.9064	0.00448	12274.4556	99.8509	9227.0042
180.0	864.9758	9.9620	0.00448	12274.4556	102.1028	9227.0042
181.0	867.5501	9.9559	0.00445	12360.8954	101.8475	9291.9831
182.0	869.9894	9.9333	0.00445	12345.1790	102.3647	9280.1688
183.0	873.2168	10.0069	0.00448	12258.7392	101.0660	9215.1899
184.0	875.6450	9.9915	0.00450	12203.7321	101.4863	9173.8397
185.0	878.1387	9.9896	0.00446	12313.7464	100.3020	9256.5401
186.0	880.5262	9.9770	0.00447	12274.4556	100.1951	9227.0042
187.0	883.2616	10.0036	0.00446	12305.8882	100.0208	9250.6329
188.0	886.5885	10.1055	0.00448	12266.5974	100.8444	9221.0971

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189.0	888.9218	10.0918	0.00449	12211.5902	101.2430	9179.7469
190.0	891.3135	10.0853	0.00449	12211.5902	100.3372	9179.7469
191.0	893.5150	10.0634	0.00448	12243.0229	100.2750	9203.3756
192.0	895.9113	10.0740	0.00451	12164.4412	100.8985	9144.3038
193.0	898.8469	10.1425	0.00448	12235.1647	101.2286	9197.4684
194.0	901.0466	10.1210	0.00448	12243.0229	99.8434	9203.3756
195.0	903.3943	10.1271	0.00449	12211.5902	98.7859	9179.7469
196.0	905.9823	10.1764	0.00446	12274.4556	98.7045	9227.0042
197.0	908.1059	10.1635	0.00446	12274.4556	100.9920	9227.0042
198.0	910.1591	10.1354	0.00445	12305.8882	99.5085	9250.6329
199.0	912.6274	10.1585	0.00447	12274.4556	99.3704	9227.0042
200.0	915.0105	10.1882	0.00445	12298.0300	99.4048	9244.7258
201.0	917.1011	10.1818	0.00449	12195.8739	99.0684	9167.9325
202.0	918.8101	10.1457	0.00446	12266.5974	100.0810	9221.0971
203.0	921.0946	10.1741	0.00448	12227.3066	100.3609	9191.5612
204.0	923.3715	10.1930	0.00447	12250.8811	100.3302	9209.2827
205.0	925.5088	10.2134	0.00446	12258.7392	99.4489	9215.1899
206.0	927.5590	10.2148	0.00444	12305.8882	98.6005	9250.6329
207.0	929.4974	10.2136	0.00443	12337.3209	98.0319	9274.2616
208.0	931.3248	10.1895	0.00449	12195.8739	100.6999	9167.9325
209.0	933.2819	10.1942	0.00447	12235.1647	99.6710	9197.4684
210.0	935.6886	10.2491	0.00442	12384.4699	99.6827	9309.7047
211.0	937.7787	10.2676	0.00445	12298.0300	99.0268	9244.7258
212.0	939.4060	10.2381	0.00444	12290.1719	98.9990	9238.8186
213.0	941.5659	10.2785	0.00448	12203.7321	99.1770	9173.8397
214.0	943.1668	10.2475	0.00450	12164.4412	99.2835	9144.3038
215.0	945.0327	10.2548	0.00445	12298.0300	99.6150	9244.7258
216.0	947.6792	10.3465	0.00448	12203.7321	100.1629	9173.8397
217.0	949.7708	10.3863	0.00453	12062.2851	97.7187	9067.5106
218.0	950.9593	10.3216	0.00449	12188.0157	96.8157	9162.0253
219.0	952.6891	10.3142	0.00447	12243.0229	98.6766	9203.3756
220.0	954.7875	10.3525	0.00447	12211.5902	98.5998	9179.7469
221.0	956.3656	10.3403	0.00451	12117.2922	97.8516	9108.8608
222.0	958.1849	10.3581	0.00449	12180.1576	97.6452	9156.1182
223.0	959.7048	10.3491	0.00446	12258.7392	99.2030	9215.1899
224.0	960.7258	10.2800	0.00444	12298.0300	98.9250	9244.7258
225.0	963.1414	10.3737	0.00444	12290.1719	98.1600	9238.8186
226.0	965.2175	10.4273	0.00444	12298.0300	98.1574	9244.7258
227.0	966.5184	10.3902	0.00445	12258.7392	98.5517	9215.1899
228.0	968.0907	10.3947	0.00448	12180.1576	98.2095	9156.1182
229.0	969.7994	10.4211	0.00447	12203.7321	97.1549	9173.8397
230.0	971.4522	10.4376	0.00449	12156.5831	99.0757	9138.3967
231.0	972.8921	10.4257	0.00447	12211.5902	97.4502	9179.7469
232.0	973.5235	10.3334	0.00449	12148.7249	97.1164	9132.4895
233.0	975.2587	10.3739	0.00446	12235.1647	96.9079	9197.4684
234.0	977.2302	10.4263	0.00446	12227.3066	96.7223	9191.5612
235.0	979.0527	10.4637	0.00448	12180.1576	96.8301	9156.1182
236.0	980.2456	10.4251	0.00447	12211.5902	97.2604	9179.7469
237.0	982.0322	10.4756	0.00448	12195.8739	97.7103	9167.9325
238.0	983.0524	10.4358	0.00449	12140.8667	97.4387	9126.5823
239.0	984.5410	10.4430	0.00450	12133.0086	95.5355	9120.6751
240.0	986.2747	10.4848	0.00448	12195.8739	96.7884	9167.9325
241.0	987.4458	10.4590	0.00452	12085.8596	95.7970	9085.2321
242.0	988.8934	10.4830	0.00448	12180.1576	96.3324	9156.1182
243.0	990.5445	10.5147	0.00448	12180.1576	97.1821	9156.1182
244.0	991.3028	10.4592	0.00448	12188.0157	97.2405	9162.0253
245.0	992.5527	10.4546	0.00448	12195.8739	96.5712	9167.9325
246.0	993.8008	10.4507	0.00451	12109.4341	96.9875	9102.9536
247.0	995.1998	10.4770	0.00448	12188.0157	96.2634	9162.0253
248.0	996.2690	10.4626	0.00449	12148.7249	96.1345	9132.4895
249.0	997.8148	10.5064	0.00448	12188.0157	97.2491	9162.0253
250.0	998.9515	10.5054	0.00448	12172.2994	94.6974	9150.2110
251.0	1000.7057	10.5622	0.00448	12180.1576	97.0831	9156.1182

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252.0	1001.3281	10.5139	0.00448	12172.2994	96.4864	9150.2110
253.0	1002.7391	10.5428	0.00450	12125.1504	96.8505	9114.7680
254.0	1003.1769	10.4728	0.00448	12180.1576	97.7671	9156.1182
255.0	1004.5668	10.4964	0.00453	12046.5687	96.2656	9055.6962
256.0	1005.6495	10.5077	0.00448	12140.8667	92.5881	9126.5823
257.0	1006.7352	10.5063	0.00446	12203.7321	95.4494	9173.8397
258.0	1008.6902	10.6054	0.00446	12195.8739	92.8934	9167.9325
259.0	1009.7226	10.6088	0.00444	12227.3066	95.5092	9191.5612
260.0	1010.8032	10.6214	0.00445	12219.4484	93.1636	9185.6540
261.0	1011.6504	10.5963	0.00442	12274.4556	97.3476	9227.0042
262.0	1012.4029	10.5722	0.00443	12282.3137	96.0014	9232.9114
263.0	1012.8111	10.5124	0.00445	12219.4484	96.2582	9185.6540
264.0	1014.5093	10.6040	0.00446	12164.4412	95.2538	9144.3038
265.0	1015.5354	10.6160	0.00447	12148.7249	95.2219	9132.4895
266.0	1016.0787	10.5756	0.00450	12085.8596	93.9437	9085.2321
267.0	1016.8468	10.5628	0.00447	12172.2994	93.3260	9150.2110
268.0	1017.9511	10.5810	0.00444	12235.1647	95.5872	9197.4684
269.0	1019.4164	10.6417	0.00447	12133.0086	92.2234	9120.6751
270.0	1020.4107	10.6490	0.00445	12188.0157	94.7173	9162.0253
271.0	1020.9507	10.6054	0.00448	12117.2922	95.5622	9108.8608
272.0	1022.0481	10.6230	0.00448	12117.2922	95.5371	9108.8608
273.0	1022.6494	10.5986	0.00452	12022.9942	95.1730	9037.9747
274.0	1023.2242	10.5711	0.00448	12140.8667	96.4709	9126.5823
275.0	1024.2579	10.5946	0.00453	12007.2779	96.3279	9026.1604
276.0	1025.4774	10.6414	0.00453	12022.9942	95.3701	9037.9747
277.0	1026.4187	10.6524	0.00454	11983.7034	95.4412	9008.4388
278.0	1027.1724	10.6516	0.00457	11889.4054	94.2980	8937.5528
279.0	1027.6300	10.6093	0.00458	11889.4054	94.4979	8937.5528
280.0	1028.6830	10.6403	0.00454	11960.1289	93.2281	8990.7173
281.0	1030.0527	10.7006	0.00453	11999.4197	93.7455	9020.2532
282.0	1030.5542	10.6689	0.00456	11928.6962	92.1768	8967.0886
283.0	1031.2089	10.6554	0.00453	12007.2779	91.6314	9026.1604
284.0	1031.6944	10.6087	0.00455	11960.1289	93.3372	8990.7173
285.0	1032.5280	10.6173	0.00451	12062.2851	92.4707	9067.5106
286.0	1033.5055	10.6455	0.00452	12007.2779	88.8185	9026.1604
287.0	1034.2852	10.6420	0.00446	12180.1576	94.0553	9156.1182
288.0	1035.3465	10.6743	0.00450	12085.8596	95.4607	9085.2321
289.0	1035.9328	10.6620	0.00453	11999.4197	91.1425	9020.2532
290.0	1036.5054	10.6569	0.00450	12093.7177	92.9293	9091.1393
291.0	1037.0591	10.6395	0.00450	12101.5759	92.3041	9097.0464
292.0	1038.2283	10.6844	0.00455	11944.4126	91.5398	8978.9030
293.0	1039.6132	10.7627	0.00453	12015.1361	94.4339	9032.0675
294.0	1039.8597	10.7257	0.00458	11881.5472	90.7104	8931.6456
295.0	1039.6174	10.6385	0.00455	11928.6962	92.5782	8967.0886
296.0	1040.3310	10.6428	0.00454	11967.9871	94.2402	8996.6245
297.0	1041.5746	10.7140	0.00452	12030.8524	92.1003	9043.8819
298.0	1042.6559	10.7614	0.00455	11952.2707	92.4820	8984.8102
299.0	1042.9169	10.7173	0.00455	11952.2707	93.7596	8984.8102
300.0	1043.6078	10.7202	0.00455	11936.5544	93.4124	8972.9958
301.0	1044.2601	10.7232	0.00457	11897.2636	93.7818	8943.4599
302.0	1044.5949	10.6894	0.00454	11975.8452	92.7881	9002.5317
303.0	1045.6864	10.7427	0.00452	12022.9942	94.4668	9037.9747
304.0	1045.5773	10.6794	0.00452	12015.1361	92.4755	9032.0675
305.0	1046.1462	10.6738	0.00450	12093.7177	93.9886	9091.1393
306.0	1046.7153	10.6711	0.00450	12085.8596	94.4003	9085.2321
307.0	1047.3171	10.6706	0.00456	11912.9799	94.2938	8955.2743
308.0	1047.9973	10.6866	0.00454	11960.1289	90.9708	8990.7173
309.0	1048.1186	10.6426	0.00454	11952.2707	91.8777	8984.8102
310.0	1049.8305	10.7632	0.00456	11897.2636	91.6741	8943.4599
311.0	1050.1942	10.7412	0.00455	11952.2707	92.7092	8984.8102
312.0	1050.4155	10.7088	0.00454	11967.9871	92.6195	8996.6245
313.0	1051.1154	10.7226	0.00456	11928.6962	91.4777	8967.0886
314.0	1051.9584	10.7501	0.00456	11920.8381	91.1147	8961.1815

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315.0	1052.4540	10.7369	0.00457	11881.5472	92.2401	8931.6456
316.0	1052.8917	10.7225	0.00456	11920.8381	93.3706	8961.1815
317.0	1053.6212	10.7482	0.00457	11889.4054	91.1376	8937.5528
318.0	1054.5337	10.7930	0.00456	11912.9799	92.9652	8955.2743
319.0	1055.3516	10.8260	0.00459	11834.3982	90.6156	8896.2026
320.0	1056.2067	10.8663	0.00456	11905.1217	88.7301	8949.3671
321.0	1055.8508	10.7606	0.00454	11967.9871	93.7155	8996.6245
322.0	1057.0808	10.8425	0.00458	11865.8309	93.2563	8919.8312
323.0	1056.5570	10.7465	0.00454	11967.9871	92.7631	8996.6245
324.0	1057.1331	10.7645	0.00457	11897.2636	94.0826	8943.4599
325.0	1057.3553	10.7364	0.00453	11983.7034	92.3441	9008.4388
326.0	1058.2790	10.7871	0.00456	11920.8381	92.4574	8961.1815
327.0	1058.1143	10.7247	0.00456	11912.9799	90.1247	8955.2743
328.0	1059.2896	10.7932	0.00456	11912.9799	90.5280	8955.2743
329.0	1059.6610	10.7793	0.00455	11936.5544	91.6551	8972.9958
330.0	1060.5081	10.8301	0.00454	11960.1289	89.4141	8990.7173
331.0	1060.6962	10.7928	0.00456	11920.8381	93.0952	8961.1815
332.0	1061.5608	10.8452	0.00457	11889.4054	91.4531	8937.5528
333.0	1061.5239	10.8007	0.00453	11999.4197	91.8635	9020.2532
334.0	1061.6334	10.7701	0.00456	11897.2636	91.8038	8943.4599
335.0	1062.2978	10.7969	0.00461	11787.2492	91.0095	8860.7595
336.0	1062.2957	10.7520	0.00459	11826.5401	92.1748	8890.2954
337.0	1062.7763	10.7587	0.00457	11889.4054	91.7274	8937.5528
338.0	1063.4654	10.7942	0.00456	11912.9799	91.1746	8955.2743
339.0	1063.7341	10.7902	0.00458	11865.8309	91.4985	8919.8312
340.0	1063.8557	10.7581	0.00455	11944.4126	93.0814	8978.9030
341.0	1064.4454	10.7768	0.00460	11818.6819	91.6295	8884.3882
342.0	1064.5886	10.7595	0.00458	11865.8309	90.5789	8919.8312
343.0	1065.3000	10.7860	0.00455	11944.4126	92.6762	8978.9030
344.0	1065.3845	10.7524	0.00456	11912.9799	91.1281	8955.2743
345.0	1065.7170	10.7413	0.00457	11912.9799	92.3845	8955.2743
346.0	1066.3331	10.7602	0.00460	11818.6819	93.4735	8884.3882
347.0	1067.0289	10.8023	0.00462	11779.3911	92.6700	8854.8523
348.0	1067.0622	10.7839	0.00459	11850.1146	92.7118	8908.0169
349.0	1066.9878	10.7355	0.00460	11818.6819	94.0770	8884.3882
350.0	1067.9539	10.7971	0.00458	11881.5472	92.3995	8931.6456
351.0	1067.9975	10.7746	0.00457	11905.1217	93.1341	8949.3671
352.0	1068.5861	10.8217	0.00454	11967.9871	93.8216	8996.6245
353.0	1069.1095	10.8613	0.00449	12085.8596	92.7620	9085.2321
354.0	1068.5488	10.7638	0.00452	12007.2779	91.9785	9026.1604
355.0	1069.6814	10.8585	0.00452	11999.4197	93.2758	9020.2532
356.0	1069.8104	10.8378	0.00446	12172.2994	94.9807	9150.2110
357.0	1070.2671	10.8369	0.00459	11826.5401	95.1154	8890.2954
358.0	1071.1984	10.8868	0.00463	11755.8166	95.5153	8837.1308
359.0	1071.0884	10.8367	0.00458	11865.8309	94.7876	8919.8312
360.0	1071.1112	10.8175	0.00460	11795.1074	93.2420	8866.6667
361.0	1070.8438	10.7641	0.00457	11881.5472	93.3961	8931.6456
362.0	1071.5606	10.8299	0.00452	11999.4197	93.4009	9020.2532
363.0	1071.7338	10.8226	0.00452	12007.2779	93.1559	9026.1604
364.0	1072.2406	10.8283	0.00459	11818.6819	92.8209	8884.3882
365.0	1072.5813	10.8335	0.00459	11834.3982	92.4121	8896.2026
366.0	1072.7470	10.8340	0.00459	11818.6819	92.2014	8884.3882
367.0	1072.4521	10.7772	0.00459	11834.3982	92.5768	8896.2026
368.0	1072.5236	10.7659	0.00453	11999.4197	93.3081	9020.2532
369.0	1072.4756	10.7427	0.00453	11991.5616	92.0382	9014.3460
370.0	1073.1620	10.7886	0.00452	12022.9942	93.1774	9037.9747
371.0	1073.9129	10.8421	0.00453	11975.8452	93.4356	9002.5317
372.0	1073.7593	10.7897	0.00458	11873.6891	93.2123	8925.7384
373.0	1073.8906	10.7947	0.00456	11912.9799	93.1510	8955.2743
374.0	1073.9079	10.7774	0.00458	11842.2564	92.4294	8902.1097
375.0	1073.5338	10.7026	0.00456	11905.1217	93.4835	8949.3671
376.0	1074.2009	10.7552	0.00454	11936.5544	94.2525	8972.9958
377.0	1074.2259	10.7333	0.00453	11991.5616	94.2568	9014.3460

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378.0	1075.1607	10.7978	0.00451	12046.5687	93.3963	9055.6962
379.0	1075.8385	10.8294	0.00450	12054.4269	93.2404	9061.6034
380.0	1077.2724	10.9535	0.00453	11944.4126	88.4371	8978.9030
381.0	1070.9508	10.7489	0.00449	11802.9656	90.5985	8872.5739
382.0	1034.6762	11.7355	0.00206	19637.5572	119.3450	14762.0254
383.0	986.1098	12.4022	0.00133	20533.3882	116.0880	15435.4431
384.0	943.3879	12.6488	0.00084	20816.2822	112.2071	15648.1013
385.0	909.1851	12.8547	0.00055	20148.3380	110.0401	15145.9916
386.0	881.4096	13.0665	0.00036	18836.0243	104.8647	14159.4937
387.0	856.3596	12.9479	0.00020	18183.7965	100.3090	13669.1984
388.0	834.4938	12.7935	0.00009	17987.3424	99.7849	13521.5190
389.0	815.0697	12.8044	0.00002	17295.8237	95.7834	13001.6878
390.0	809.6926	13.2459	-.00004	17704.4484	98.7757	13308.8608
391.0	802.9896	13.4680	-.00008	15449.1547	87.5637	11613.5021
392.0	797.3085	13.7810	-.00011	16439.2836	92.2663	12357.8059
393.0	791.4366	14.0881	-.00014	15747.7650	88.9313	11837.9747
394.0	782.2541	13.9605	-.00015	16525.7234	92.9020	12422.7848
395.0	776.8318	14.2756	-.00018	14836.2177	85.7144	11152.7426
396.0	769.1752	14.3028	-.00018	15944.2192	92.4124	11985.6540
397.0	759.3524	14.0346	-.00021	14419.7349	83.1002	10839.6625
398.0	750.9465	13.9351	-.00020	15354.8567	87.9151	11542.6161
399.0	745.5515	14.2055	-.00021	15802.7722	90.7047	11879.3249
400.0	741.9003	14.7121	-.00024	13492.4713	78.7447	10142.6161
401.0	733.0584	14.5160	-.00026	13075.9885	78.3541	9829.5359
402.0	728.0312	14.8242	-.00026	13869.6633	81.7171	10426.1604
403.0	721.0694	14.8199	-.00027	13806.7980	81.8369	10378.9030
404.0	713.5899	14.7690	-.00029	13508.1876	79.4963	10154.4304
405.0	704.1758	14.4282	-.00030	13327.4498	80.2348	10018.5654
406.0	700.7835	14.9315	-.00027	14875.5086	88.3373	11182.2785
407.0	695.2522	15.0978	-.00029	13641.7765	82.2317	10254.8523
408.0	686.2196	14.7768	-.00031	12934.5415	78.5843	9723.2068
409.0	677.8682	14.5033	-.00029	14569.0401	86.4888	10951.8988
410.0	671.6012	14.5561	-.00030	13728.2163	82.3254	10319.8313
411.0	665.0754	14.5850	-.00033	13130.9957	79.1209	9870.8861
412.0	657.9501	14.4499	-.00036	12227.3066	74.8661	9191.5612
413.0	654.5850	14.9203	-.00032	13586.7693	83.0262	10213.5021
414.0	649.1764	15.0330	-.00033	13256.7263	82.3115	9965.4009
415.0	644.0266	15.2252	-.00032	13736.0745	82.7862	10325.7384
416.0	637.7460	15.2227	-.00035	12415.9025	76.4500	9333.3334
417.0	630.0485	14.9458	-.00033	13130.9957	81.9805	9870.8861
418.0	623.8088	14.9395	-.00040	10993.5745	69.9263	8264.1350
419.0	619.1630	15.1426	-.00041	10844.2693	70.2197	8151.8988
420.0	612.5282	14.9966	-.00050	9123.3309	60.4550	6858.2279
421.0	609.4901	15.4868	-.00044	10498.5100	69.6855	7891.9831
422.0	604.1632	15.5423	-.00044	10584.9498	70.2826	7956.9620
423.0	598.1551	15.4606	-.00046	9932.7220	66.7472	7466.6667
424.0	595.0352	15.9337	-.00046	10192.0415	69.5202	7661.6034
425.0	590.1579	16.0733	-.00046	10184.1834	69.3195	7655.6962
426.0	585.6211	16.2622	-.00051	9178.3381	62.6104	6899.5781
427.0	580.1035	16.2443	-.00051	9335.5014	64.5460	7017.7215
428.0	575.6621	16.4136	-.00050	9421.9412	66.0262	7082.7004
429.0	568.9592	16.1026	-.00049	9783.4169	67.8514	7354.4304
430.0	565.3488	16.4478	-.00055	8604.6920	60.9182	6468.3544
431.0	557.5287	15.8464	-.00051	9461.2321	67.1486	7112.2363
432.0	551.8748	15.7204	-.00048	10003.4455	70.8069	7519.8312
433.0	547.8422	15.9256	-.00047	10184.1834	72.8164	7655.6962
434.0	541.9294	15.7538	-.00049	9736.2679	69.6111	7318.9874
435.0	536.3709	15.6478	-.00048	9838.4240	70.9815	7395.7806
436.0	532.2429	15.7572	-.00052	9084.0401	66.4173	6828.6920
437.0	528.7552	16.0852	-.00048	9799.1332	71.5004	7366.2447
438.0	524.0277	16.0937	-.00051	9296.2106	67.5379	6988.1857
439.0	521.3574	16.6037	-.00053	8903.3023	65.8934	6692.8270
440.0	517.3793	16.7889	-.00049	9563.3882	71.1768	7189.0296

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441.0	513.4011	16.9719	-.00049	9437.6576	70.9569	7094.5148
442.0	509.6682	17.2153	-.00053	8722.5644	66.3229	6556.9620
443.0	502.1887	16.4922	-.00053	8651.8409	66.0810	6503.7975
444.0	495.9217	16.0521	-.00050	9178.3381	69.7619	6899.5781
445.0	494.4095	16.8103	-.00049	9304.0687	71.2319	6994.0928
446.0	489.2596	16.6415	-.00051	8832.5788	68.8551	6639.6625
447.0	484.6275	16.5937	-.00049	9374.7922	73.4798	7047.2574
448.0	479.7774	16.4715	-.00048	9492.6647	74.7454	7135.8650
449.0	475.4178	16.5363	-.00050	9084.0401	71.8106	6828.6920
450.0	472.0936	16.7376	-.00054	8392.5215	66.5809	6308.8608
451.0	468.4560	16.9287	-.00050	9178.3381	74.4055	6899.5781
452.0	463.0337	16.5764	-.00050	9178.3381	72.8472	6899.5781
453.0	459.5052	16.7873	-.00052	8510.3940	68.9752	6397.4684
454.0	455.9493	17.0025	-.00051	8683.2736	72.0305	6527.4262
455.0	451.0856	16.7933	-.00050	8958.3094	73.5661	6734.1772
456.0	449.5325	17.5789	-.00052	8526.1103	71.2985	6409.2827
457.0	445.2819	17.5538	-.00053	8321.7980	70.4574	6255.6962
458.0	438.7152	16.7165	-.00050	8793.2879	74.3304	6610.1266
459.0	434.9005	16.8132	-.00050	8966.1676	75.5364	6740.0844
460.0	432.9114	17.4132	-.00053	8455.3868	72.0459	6356.1182
461.0	428.9469	17.4054	-.00047	9476.9484	81.6431	7124.0507
462.0	425.1867	17.4734	-.00047	9390.5086	81.1275	7059.0717
463.0	420.4456	17.1883	-.00050	8816.8624	76.1606	6627.8481
464.0	418.4020	17.8001	-.00046	9437.6576	82.6817	7094.5148
465.0	414.0151	17.5637	-.00052	8243.2163	73.0530	6196.6245
466.0	410.6092	17.6691	-.00048	8919.0186	79.3782	6704.6414
467.0	405.0643	17.1355	-.00049	8911.1604	77.4136	6698.7342
468.0	400.8817	17.0346	-.00051	8620.4083	75.0217	6480.1688
469.0	398.7564	17.5492	-.00056	7842.4498	71.5951	5895.3587
470.0	393.8927	17.0352	-.00054	7968.1805	73.4394	5989.8734
471.0	391.6448	17.5888	-.00053	8038.9040	74.3082	6043.0380
472.0	387.8982	17.4904	-.00047	9021.1748	84.8209	6781.4346
473.0	384.9010	17.7692	-.00048	8706.8481	83.1600	6545.1477
474.0	382.0808	18.0274	-.00049	8526.1103	81.2483	6409.2827
475.0	379.3833	18.3573	-.00051	8133.2020	77.8711	6113.9241
476.0	376.6858	18.6529	-.00052	7873.8825	76.3343	5918.9874
477.0	372.4079	18.3452	-.00047	8573.2593	83.3434	6444.7258
478.0	368.6613	18.2005	-.00050	8093.9112	79.1753	6084.3882
479.0	364.0973	17.7512	-.00046	8934.7349	87.4621	6716.4557
480.0	361.6859	18.1549	-.00050	8125.3438	81.0598	6108.0169
481.0	358.6342	18.3549	-.00048	8431.8123	84.0799	6338.3966
482.0	355.2418	18.2539	-.00045	8895.4441	89.6367	6686.9198
483.0	352.3808	18.4654	-.00048	8258.9326	83.9086	6208.4388
484.0	350.5825	19.2276	-.00047	8455.3868	87.1290	6356.1182
485.0	346.7133	18.9749	-.00044	8989.7421	91.9928	6757.8059
486.0	342.5717	18.6349	-.00047	8510.3940	88.4861	6397.4684
487.0	340.4327	19.1553	-.00047	8361.0888	87.8830	6285.2321
488.0	336.0186	18.5760	-.00048	8400.3796	88.4820	6314.7680
489.0	331.6045	17.9353	-.00051	7976.0387	84.1798	5995.7806
490.0	330.6372	19.0143	-.00052	7724.5773	82.5520	5806.7511
491.0	327.1631	18.8025	-.00050	7983.8968	87.0021	6001.6878
492.0	324.9424	19.2210	-.00047	8502.5358	93.4687	6391.5612
493.0	322.0678	19.2791	-.00053	7473.1160	83.3330	5617.7215
494.0	318.3348	18.9047	-.00050	7873.8825	87.7965	5918.9874
495.0	313.9343	18.1815	-.00048	8298.2235	92.5854	6237.9747
496.0	312.2586	18.9057	-.00051	7803.1590	87.1374	5865.8228
497.0	310.2831	19.2989	-.00056	7088.0659	79.6263	5328.2701
498.0	306.0189	18.6281	-.00057	6883.7536	79.1995	5174.6836
499.0	301.5230	17.8240	-.00053	7559.5559	85.8553	5682.7004

APPENDIX D

1000 F First Text File for Fortran Program

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0.00	29.26	29.20	29.92	28.88	28.92	29.09	29.09	29.19
1.00	29.24	29.21	29.92	28.88	28.96	29.10	29.06	29.19
2.00	29.48	29.30	29.92	28.93	29.07	29.13	29.14	32.69
3.00	31.23	30.52	29.97	29.77	29.15	29.63	29.94	55.87
4.00	34.62	33.37	30.19	32.22	29.19	31.18	32.35	81.88
5.00	39.12	37.48	31.11	36.03	29.24	33.66	35.92	102.38
6.00	44.36	42.44	32.87	40.81	29.27	36.79	40.27	118.41
7.00	50.05	47.94	35.24	46.14	29.23	40.39	45.04	131.11
8.00	55.95	53.71	38.02	51.82	29.26	44.13	50.11	141.38
9.00	61.97	59.63	40.82	57.66	29.29	47.74	55.37	150.02
10.00	68.02	65.61	43.39	63.59	29.28	51.17	60.77	157.45
11.00	74.03	71.60	45.84	69.57	29.28	54.42	66.27	164.03
12.00	80.07	77.60	48.20	75.54	29.26	57.58	71.83	170.09
13.00	86.06	83.56	50.51	81.48	29.24	60.68	77.37	175.72
14.00	91.94	89.43	52.06	87.33	29.24	63.43	82.91	181.04
15.00	97.76	95.24	53.73	93.14	29.25	66.54	88.41	186.16
16.00	103.57	101.03	55.38	98.92	29.29	69.24	93.98	191.16
17.00	109.26	106.71	56.42	104.62	29.32	71.81	99.49	196.01
18.00	114.86	112.33	57.64	110.22	29.29	75.02	104.92	200.80
19.00	120.46	117.93	58.96	115.83	29.29	77.64	110.40	205.52
20.00	125.93	123.43	60.27	121.32	29.23	80.56	115.72	210.21
21.00	131.37	128.87	61.06	126.77	29.29	84.28	121.06	214.85
22.00	136.78	134.29	62.33	132.20	29.32	86.46	126.47	219.49
23.00	142.08	139.60	63.49	137.51	29.31	89.70	131.71	224.06
24.00	147.33	144.88	64.50	142.79	29.32	92.39	136.93	228.59
25.00	152.55	150.12	65.43	148.05	29.36	94.54	142.17	233.14
26.00	157.67	155.26	66.50	153.19	29.37	97.87	147.31	237.60
27.00	162.74	160.33	67.41	158.28	29.34	100.30	152.39	242.00
28.00	167.81	165.41	68.47	163.35	29.36	103.26	157.47	246.42
29.00	172.82	170.39	69.54	168.33	29.39	106.76	162.46	250.79
30.00	177.78	175.37	70.70	173.30	29.36	108.98	167.37	255.14
31.00	182.77	180.35	71.53	178.28	29.35	112.66	172.33	259.51
32.00	187.67	185.26	72.17	183.18	29.37	116.26	177.19	263.77
33.00	192.55	190.12	73.39	188.04	29.35	118.91	182.06	267.98
34.00	197.43	194.99	74.41	192.91	29.37	121.82	186.93	272.23
35.00	202.23	199.79	75.12	197.72	29.38	125.02	191.72	276.46
36.00	206.99	204.54	76.43	202.46	29.44	127.60	196.46	280.68
37.00	211.74	209.28	77.32	207.21	29.42	130.87	201.21	284.90
38.00	216.51	214.03	78.66	211.96	29.38	134.40	205.94	289.10
39.00	221.19	218.71	79.43	216.62	29.39	137.59	210.60	293.27
40.00	225.79	223.31	80.36	221.23	29.41	140.17	215.19	297.38
41.00	230.39	227.89	81.47	225.81	29.44	143.56	219.74	301.49
42.00	235.00	232.49	82.14	230.41	29.44	147.25	224.34	305.62
43.00	239.53	237.02	83.22	234.93	29.41	149.93	228.84	309.72
44.00	243.98	241.44	83.77	239.37	29.43	152.97	233.32	313.75
45.00	248.36	245.82	84.78	243.74	29.47	155.99	237.67	317.77
46.00	252.74	250.20	86.07	248.13	29.43	159.44	242.03	321.80
47.00	257.16	254.58	86.62	252.52	29.42	162.42	246.44	325.87
48.00	261.45	258.89	87.96	256.82	29.41	165.16	250.69	329.87
49.00	265.70	263.09	88.71	261.02	29.46	167.41	254.94	333.81
50.00	269.93	267.31	89.78	265.24	29.44	171.33	259.17	337.75
51.00	274.12	271.48	90.74	269.41	29.47	174.26	263.32	341.66
52.00	278.20	275.58	91.92	273.51	29.45	176.61	267.35	345.51
53.00	282.30	279.63	92.71	277.58	29.48	179.21	271.43	349.31
54.00	286.28	283.61	93.51	281.54	29.50	183.20	275.39	353.03
55.00	290.20	287.54	94.58	285.48	29.51	184.91	279.26	356.74
56.00	294.16	291.46	95.35	289.41	29.51	189.56	283.19	360.45
57.00	298.04	295.31	96.47	293.25	29.53	191.79	287.03	364.08
58.00	301.82	299.12	97.09	297.06	29.52	194.56	290.77	367.69
59.00	305.62	302.89	98.21	300.85	29.57	196.61	294.55	371.28
60.00	309.38	306.61	99.06	304.55	29.54	199.64	298.30	374.81
61.00	313.04	310.28	100.11	308.23	29.52	202.58	301.94	378.31
62.00	316.72	313.92	100.81	311.88	29.51	205.43	305.58	381.75

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63.00	320.31	317.51	101.46	315.46	29.53	209.38	309.11	385.12
64.00	323.87	321.05	102.34	319.00	29.58	210.82	312.63	388.48
65.00	327.39	324.54	102.55	322.51	29.57	214.08	316.20	391.80
66.00	330.86	328.00	104.04	325.96	29.58	216.94	319.58	395.07
67.00	334.28	331.39	104.58	329.34	29.56	219.27	323.00	398.29
68.00	337.66	334.77	105.64	332.73	29.58	222.15	326.38	401.49
69.00	341.01	338.08	106.17	336.03	29.60	224.23	329.69	404.64
70.00	344.26	341.35	106.86	339.32	29.62	227.91	332.87	407.76
71.00	347.53	344.59	107.44	342.56	29.63	230.42	336.14	410.85
72.00	350.75	347.77	108.72	345.76	29.67	232.29	339.37	413.88
73.00	353.90	350.89	108.97	348.89	29.63	234.89	342.54	416.88
74.00	357.03	354.01	109.22	352.00	29.67	237.94	345.63	419.87
75.00	360.09	357.07	110.53	355.06	29.68	240.83	348.66	422.81
76.00	363.11	360.07	111.54	358.07	29.70	241.92	351.64	425.72
77.00	366.14	363.04	112.38	361.02	29.67	244.48	354.58	428.59
78.00	369.02	365.97	113.25	363.96	29.67	246.81	357.43	431.39
79.00	371.97	368.86	113.64	366.84	29.69	249.29	360.40	434.17
80.00	374.82	371.73	114.21	369.72	29.77	250.89	363.19	436.93
81.00	377.68	374.52	115.16	372.51	29.74	253.57	366.04	439.65
82.00	380.45	377.29	116.04	375.27	29.74	256.63	368.78	442.32
83.00	383.21	380.04	116.63	378.03	29.75	259.25	371.53	444.97
84.00	385.92	382.74	116.89	380.72	29.71	260.99	374.20	447.58
85.00	388.63	385.39	117.68	383.37	29.72	263.26	376.89	450.15
86.00	391.27	388.03	118.60	386.02	29.76	264.38	379.52	452.70
87.00	393.86	390.62	119.13	388.61	29.77	266.81	382.08	455.21
88.00	396.43	393.16	119.53	391.16	29.71	269.25	384.68	457.69
89.00	398.98	395.69	119.98	393.68	29.73	270.92	387.20	460.16
90.00	401.45	398.16	121.54	396.15	29.78	272.96	389.63	462.56
91.00	403.92	400.59	122.03	398.59	29.75	274.74	392.11	464.93
92.00	406.36	403.02	122.36	401.01	29.82	277.22	394.53	467.28
93.00	408.72	405.39	122.55	403.38	29.81	280.01	396.88	469.58
94.00	411.09	407.73	123.49	405.72	29.85	281.43	399.29	471.86
95.00	413.44	410.05	124.37	408.03	29.83	283.45	401.56	474.12
96.00	415.70	412.31	124.57	410.30	29.86	284.82	403.78	476.29
97.00	417.98	414.55	125.26	412.54	29.87	287.29	406.11	478.51
98.00	420.21	416.78	125.88	414.77	29.87	289.24	408.30	480.67
99.00	422.39	418.94	126.63	416.94	29.89	291.41	410.45	482.76
100.00	424.55	421.09	126.94	419.06	29.87	293.87	412.54	484.87
101.00	426.72	423.24	127.19	421.23	29.86	295.44	414.86	486.98
102.00	428.82	425.34	128.03	423.32	29.89	296.71	416.85	489.04
103.00	430.89	427.38	128.64	425.36	29.89	298.39	418.93	491.04
104.00	432.93	429.41	129.07	427.40	29.92	300.89	420.97	493.02
105.00	434.98	431.46	129.74	429.47	29.96	301.00	423.03	495.01
106.00	436.99	433.44	129.91	431.44	29.93	302.79	425.03	496.93
107.00	438.93	435.36	130.27	433.33	29.93	306.28	426.88	498.84
108.00	440.79	437.28	130.94	435.28	30.01	306.14	428.78	500.74
109.00	442.77	439.17	131.58	437.15	29.99	308.68	430.78	502.62
110.00	444.66	441.06	131.55	439.07	30.03	311.51	432.68	504.48
111.00	446.50	442.88	132.09	440.87	30.01	313.14	434.55	506.27
112.00	448.32	444.68	132.98	442.68	30.03	313.06	436.36	508.04
113.00	450.08	446.46	133.58	444.46	30.04	314.02	438.04	509.79
114.00	451.89	448.23	134.04	446.23	30.05	316.84	439.90	511.57
115.00	453.62	449.96	134.18	447.97	30.08	319.73	441.64	513.32
116.00	455.39	451.67	134.94	449.64	30.09	319.72	443.41	515.07
117.00	457.12	453.36	135.72	451.34	30.08	321.02	445.16	516.75
118.00	458.81	455.03	136.08	453.02	30.06	321.84	446.84	518.42
119.00	460.46	456.66	136.50	454.63	30.09	323.89	448.45	520.04
120.00	462.02	458.26	136.88	456.26	30.13	324.54	449.98	521.58
121.00	463.57	459.85	137.48	457.84	30.12	326.78	451.51	523.12
122.00	465.13	461.42	137.44	459.42	30.12	329.51	453.15	524.66
123.00	466.74	462.96	138.11	460.96	30.14	330.52	454.76	526.18
124.00	468.27	464.46	138.31	462.45	30.17	332.24	456.27	527.69
125.00	469.74	465.94	138.74	463.93	30.17	332.43	457.73	529.16

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126.00	471.22	467.42	139.35	465.42	30.16	334.31	459.19	530.63
127.00	472.74	468.88	140.14	466.85	30.19	335.62	460.73	532.08
128.00	474.15	470.32	139.98	468.33	30.14	336.65	462.17	533.52
129.00	475.58	471.73	140.31	469.71	30.17	337.07	463.53	534.93
130.00	476.94	473.11	141.19	471.09	30.19	338.17	464.84	536.30
131.00	478.33	474.48	141.07	472.46	30.24	340.53	466.29	537.67
132.00	479.73	475.83	141.36	473.79	30.25	342.38	467.76	539.05
133.00	481.07	477.14	141.86	475.08	30.27	342.67	469.04	540.37
134.00	482.37	478.46	141.98	476.45	30.26	343.81	470.38	541.67
135.00	483.65	479.73	142.75	477.68	30.27	344.49	471.66	542.94
136.00	484.94	481.02	143.03	478.99	30.32	345.84	472.93	544.20
137.00	486.21	482.29	143.07	480.24	30.29	347.74	474.21	545.44
138.00	487.50	483.51	143.79	481.48	30.29	348.79	475.55	546.64
139.00	488.67	484.72	143.98	482.71	30.31	350.39	476.74	547.83
140.00	489.82	485.91	144.51	483.87	30.32	351.30	477.79	549.02
141.00	491.03	487.09	144.52	485.11	30.32	352.18	479.13	550.18
142.00	492.27	488.24	144.85	486.21	30.33	352.71	480.33	551.33
143.00	493.39	489.38	144.89	487.37	30.32	354.71	481.44	552.45
144.00	494.56	490.50	145.59	488.46	30.42	355.07	482.59	553.57
145.00	495.60	491.62	146.15	489.62	30.37	355.57	483.64	554.67
146.00	496.83	492.73	146.76	490.69	30.33	356.38	484.86	555.78
147.00	497.89	493.82	146.92	491.76	30.36	356.29	485.83	556.84
148.00	498.98	494.88	147.19	492.83	30.36	358.79	486.96	557.89
149.00	499.97	495.92	146.63	493.86	30.40	359.33	487.99	558.96
150.00	500.96	496.97	147.63	494.96	30.42	361.01	488.98	559.99
151.00	502.07	497.97	148.22	495.95	30.40	362.31	490.18	560.99
152.00	503.01	498.98	148.13	496.95	30.47	363.81	491.03	561.97
153.00	504.09	499.97	148.44	497.92	30.46	363.87	492.13	562.97
154.00	505.00	500.95	148.49	498.91	30.48	365.14	493.02	563.91
155.00	506.02	501.91	148.76	499.87	30.46	364.69	494.07	564.85
156.00	506.93	502.86	149.17	500.84	30.50	366.56	495.02	565.76
157.00	507.92	503.78	149.59	501.74	30.50	367.53	496.02	566.70
158.00	508.81	504.69	150.18	502.64	30.54	368.47	496.92	567.60
159.00	509.71	505.58	149.84	503.54	30.48	369.51	497.79	568.51
160.00	510.60	506.46	150.03	504.41	30.53	371.05	498.77	569.38
161.00	511.49	507.33	150.87	505.27	30.58	371.33	499.62	570.25
162.00	512.35	508.17	150.98	506.11	30.53	371.81	500.48	571.09
163.00	513.18	509.03	151.13	507.00	30.57	370.90	501.28	571.92
164.00	514.04	509.86	151.03	507.84	30.57	373.42	502.23	572.74
165.00	514.87	510.67	151.33	508.63	30.60	374.85	503.02	573.58
166.00	515.67	511.48	151.88	509.46	30.61	375.14	503.86	574.40
167.00	516.53	512.29	152.03	510.29	30.62	374.74	504.73	575.20
168.00	517.27	513.07	152.56	511.04	30.59	376.04	505.41	575.92
169.00	518.04	513.83	152.34	511.82	30.66	374.95	506.18	576.63
170.00	518.78	514.61	152.41	512.62	30.63	376.78	506.95	577.36
171.00	519.62	515.35	152.83	513.32	30.67	377.79	507.79	578.07
172.00	520.24	516.07	153.21	514.03	30.69	378.32	508.31	578.76
173.00	521.05	516.79	153.33	514.76	30.67	380.54	509.25	579.47
174.00	521.69	517.48	153.64	515.46	30.66	380.65	509.89	580.17
175.00	522.41	518.18	153.73	516.14	30.68	380.63	510.56	580.87
176.00	523.11	518.87	153.68	516.82	30.69	379.94	511.33	581.56
177.00	523.78	519.53	154.40	517.52	30.71	382.99	512.11	582.22
178.00	524.48	520.18	154.38	518.09	30.70	384.30	512.82	582.91
179.00	525.11	520.86	154.34	518.79	30.72	383.15	513.39	583.58
180.00	525.78	521.54	154.66	519.49	30.86	383.17	513.97	584.25
181.00	526.46	522.18	155.07	520.11	30.85	383.08	514.66	584.89
182.00	527.13	522.83	155.31	520.76	30.93	382.53	515.27	585.52
183.00	527.77	523.47	155.71	521.43	30.88	384.57	516.02	586.12
184.00	528.35	524.07	155.76	522.00	30.87	382.88	516.46	586.72
185.00	528.98	524.67	155.96	522.58	30.89	384.50	517.17	587.33
186.00	529.60	525.27	157.52	523.18	30.95	385.47	517.78	587.95
187.00	530.20	525.86	157.93	523.75	31.02	385.72	518.41	588.54
188.00	530.78	526.43	156.59	524.31	30.93	386.65	518.94	589.13

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189.00	531.36	526.97	156.64	524.83	30.86	389.87	519.65	589.71
190.00	531.87	527.52	157.19	525.40	30.89	391.06	520.23	590.27
191.00	532.43	528.09	157.22	525.96	30.89	390.61	520.76	590.85
192.00	532.86	528.62	157.81	526.45	30.83	394.71	521.34	591.41
193.00	533.51	529.18	157.62	527.01	30.84	391.70	521.84	591.94
194.00	534.11	529.71	157.36	527.53	30.88	392.43	522.40	592.47
195.00	534.65	530.23	157.72	528.13	30.85	391.48	522.99	592.98
196.00	535.14	530.76	157.77	528.68	30.86	390.22	523.44	593.51
197.00	535.64	531.28	157.72	529.20	30.88	390.82	523.94	594.01
198.00	536.22	531.77	158.10	529.66	31.01	390.12	524.46	594.52
199.00	536.61	532.27	158.32	530.20	30.98	390.64	524.81	595.03
200.00	537.12	532.75	158.91	530.70	30.98	392.92	525.49	595.51
201.00	537.64	533.22	158.67	531.13	31.03	394.32	525.98	595.99
202.00	538.11	533.69	158.74	531.58	31.07	394.29	526.44	596.47
203.00	538.58	534.14	158.71	532.04	30.97	395.16	526.92	596.92
204.00	539.01	534.58	158.87	532.46	30.94	398.44	527.46	597.38
205.00	539.44	535.03	159.32	532.93	30.95	397.77	527.89	597.85
206.00	539.90	535.49	159.57	533.39	30.96	397.38	528.36	598.31
207.00	540.28	535.92	159.44	533.83	30.93	398.12	528.67	598.73
208.00	540.77	536.36	159.57	534.29	30.91	397.87	529.23	599.17
209.00	541.29	536.81	159.68	534.70	31.00	396.93	529.69	599.61
210.00	541.69	537.23	159.72	535.14	30.89	398.21	530.14	600.01
211.00	542.10	537.64	159.47	535.54	30.93	398.47	530.50	600.42
212.00	542.53	538.06	159.71	535.98	30.97	398.11	530.95	600.81
213.00	542.94	538.46	159.57	536.37	30.97	398.78	531.37	601.22
214.00	543.36	538.87	160.22	536.78	30.96	399.43	531.76	601.62
215.00	543.72	539.26	160.31	537.17	30.94	400.17	532.17	602.03
216.00	544.16	539.66	160.46	537.54	30.92	399.22	532.58	602.42
217.00	544.53	540.03	161.04	537.93	30.94	400.46	533.01	602.80
218.00	544.93	540.40	160.44	538.29	31.04	400.21	533.32	603.19
219.00	545.27	540.77	160.62	538.67	31.02	401.01	533.72	603.57
220.00	545.64	541.13	160.40	539.03	30.99	402.16	534.16	603.93
221.00	545.99	541.49	160.82	539.37	30.98	402.67	534.52	604.28
222.00	546.37	541.86	160.78	539.73	31.00	401.56	534.84	604.62
223.00	546.72	542.20	160.81	540.09	31.04	401.63	535.25	604.96
224.00	547.07	542.55	161.06	540.45	31.04	403.83	535.56	605.30
225.00	547.42	542.88	160.86	540.79	31.06	403.21	535.96	605.64
226.00	547.73	543.21	161.14	541.13	31.04	403.45	536.29	605.98
227.00	548.04	543.57	161.31	541.51	31.12	402.95	536.63	606.30
228.00	548.37	543.89	161.57	541.83	31.09	405.03	536.94	606.63
229.00	548.78	544.21	161.06	542.13	30.98	406.23	537.43	606.96
230.00	549.07	544.51	161.61	542.36	31.01	407.94	537.62	607.28
231.00	549.36	544.82	161.67	542.72	31.08	405.91	537.96	607.59
232.00	549.74	545.14	161.18	543.01	31.06	406.88	538.34	607.92
233.00	550.07	545.46	161.52	543.36	31.06	407.33	538.73	608.24
234.00	550.41	545.77	162.31	543.63	31.06	407.01	538.99	608.57
235.00	550.58	546.06	162.34	543.97	31.07	407.48	539.23	608.87
236.00	550.89	546.34	161.95	544.21	31.01	408.53	539.49	609.17
237.00	551.19	546.65	162.37	544.56	31.09	407.44	539.85	609.47
238.00	551.49	546.93	162.77	544.84	31.10	408.38	540.11	609.76
239.00	551.76	547.21	162.69	545.13	31.04	409.43	540.47	610.03
240.00	552.04	547.51	162.99	545.42	31.09	408.43	540.67	610.31
241.00	552.39	547.78	162.66	545.68	31.15	407.40	540.97	610.58
242.00	552.53	548.03	162.78	545.98	31.16	408.18	541.09	610.83
243.00	552.89	548.32	162.51	546.32	31.16	407.91	541.61	611.09
244.00	553.22	548.59	163.09	546.54	31.13	409.48	541.97	611.36
245.00	553.46	548.84	162.75	546.80	31.12	410.02	542.22	611.61
246.00	553.71	549.10	162.98	547.08	31.16	409.33	542.46	611.86
247.00	553.91	549.34	163.08	547.27	31.10	409.36	542.57	612.12
248.00	554.19	549.58	162.96	547.51	31.08	410.30	542.98	612.35
249.00	554.41	549.82	163.07	547.71	31.11	412.02	543.13	612.59
250.00	554.63	550.03	163.18	547.93	31.08	412.23	543.37	612.83
251.00	554.87	550.27	163.89	548.16	31.14	409.58	543.60	613.08

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252.00	555.15	550.52	163.66	548.41	31.16	410.41	543.86	613.31
253.00	555.43	550.77	163.83	548.62	31.16	407.72	544.03	613.55
254.00	555.73	551.02	163.77	548.90	31.19	410.68	544.50	613.79
255.00	555.88	551.24	163.66	549.08	31.16	411.76	544.61	614.02
256.00	556.09	551.43	163.29	549.30	31.12	413.36	544.83	614.22
257.00	556.28	551.64	163.82	549.52	31.11	412.92	545.06	614.42
258.00	556.52	551.84	164.01	549.72	31.11	413.17	545.32	614.62
259.00	556.66	552.03	163.87	549.92	31.13	412.69	545.39	614.81
260.00	556.95	552.24	164.17	550.17	31.18	413.31	545.82	615.03
261.00	557.05	552.44	164.53	550.38	31.14	413.35	545.86	615.26
262.00	557.35	552.64	164.61	550.54	31.24	413.74	546.18	615.49
263.00	557.53	552.84	165.08	550.75	31.18	415.55	546.52	615.71
264.00	557.71	553.03	164.70	550.92	31.29	415.06	546.59	615.92
265.00	557.83	553.27	165.16	551.18	31.32	414.67	546.59	616.12
266.00	558.05	553.48	164.79	551.44	31.24	414.59	546.91	616.30
267.00	558.32	553.68	165.03	551.63	31.28	415.87	547.23	616.47
268.00	558.46	553.88	165.07	551.83	31.22	416.28	547.45	616.63
269.00	558.57	554.07	165.28	551.94	31.25	416.08	547.39	616.79
270.00	558.66	554.26	165.23	552.13	31.16	420.99	547.86	616.96
271.00	558.98	554.46	165.59	552.36	31.27	417.70	547.97	617.16
272.00	559.12	554.64	165.74	552.61	31.37	418.18	548.10	617.32
273.00	559.22	554.83	165.63	552.76	31.29	419.11	548.23	617.51
274.00	559.51	555.02	165.94	552.99	31.37	415.60	548.37	617.68
275.00	559.73	555.18	165.62	553.15	31.27	416.75	548.64	617.88
276.00	559.94	555.36	165.41	553.32	31.32	414.92	548.85	618.07
277.00	560.03	555.52	165.54	553.49	31.39	414.79	548.84	618.26
278.00	560.33	555.69	165.57	553.62	31.46	415.23	549.12	618.41
279.00	560.40	555.82	166.03	553.77	31.43	419.30	549.23	618.52
280.00	560.47	555.97	166.21	553.99	31.37	419.21	549.41	618.63
281.00	560.66	556.09	165.74	554.05	31.31	421.50	549.81	618.79
282.00	560.71	556.26	166.42	554.26	31.36	417.09	549.72	618.93
283.00	560.92	556.41	165.36	554.34	31.27	421.36	550.13	619.09
284.00	560.93	556.59	165.19	554.43	31.26	422.60	550.19	619.21
285.00	561.11	556.74	165.98	554.62	31.17	419.20	550.19	619.34
286.00	561.43	556.91	166.32	554.79	31.22	419.10	550.46	619.47
287.00	561.46	557.04	165.89	554.92	31.29	422.77	550.53	619.62
288.00	561.61	557.21	166.09	555.18	31.33	420.47	550.69	619.74
289.00	561.74	557.31	165.78	555.25	31.36	422.64	550.93	619.88
290.00	561.86	557.46	165.58	555.48	31.52	418.72	550.87	620.03
291.00	562.16	557.60	165.68	555.65	31.49	417.13	551.22	620.19
292.00	562.31	557.71	166.06	555.69	31.48	417.82	551.24	620.35
293.00	562.39	557.84	166.43	555.92	31.54	417.91	551.39	620.46
294.00	562.57	557.97	166.19	556.01	31.56	417.54	551.50	620.57
295.00	562.73	558.08	166.61	556.12	31.48	416.86	551.65	620.66
296.00	562.71	558.18	166.50	556.27	31.41	419.56	551.66	620.76
297.00	562.88	558.27	167.19	556.37	31.41	416.53	551.84	620.84
298.00	562.99	558.37	166.79	556.49	31.47	417.62	551.97	620.99
299.00	563.09	558.46	167.11	556.59	31.36	418.50	552.08	621.13
300.00	563.22	558.55	166.55	556.67	31.32	418.44	552.27	621.26
301.00	563.26	558.64	166.76	556.75	31.35	418.89	552.31	621.38
302.00	563.45	558.76	167.15	556.88	31.44	418.14	552.52	621.48
303.00	563.51	558.84	166.83	556.90	31.41	418.38	552.57	621.59
304.00	563.62	558.94	166.24	557.06	31.43	419.61	552.80	621.70
305.00	563.68	559.04	166.44	557.13	31.41	420.23	552.80	621.82
306.00	563.78	559.13	165.96	557.21	31.42	421.59	552.96	621.92
307.00	563.90	559.24	166.69	557.33	31.47	421.37	553.06	622.02
308.00	563.97	559.32	166.57	557.42	31.42	421.68	553.16	622.14
309.00	564.12	559.43	166.79	557.54	31.55	419.23	553.26	622.24
310.00	564.16	559.53	166.93	557.70	31.40	420.44	553.28	622.33
311.00	564.31	559.63	167.02	557.79	31.43	418.86	553.42	622.44
312.00	564.38	559.71	166.30	557.89	31.40	421.62	553.57	622.53
313.00	564.47	559.79	166.38	557.92	31.38	422.18	553.63	622.64
314.00	564.52	559.89	166.31	558.07	31.32	421.19	553.77	622.72

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315.00	564.62	559.96	166.98	558.10	31.36	421.11	553.82	622.83
316.00	564.71	560.05	167.02	558.18	31.47	419.94	553.84	622.93
317.00	564.89	560.17	166.92	558.31	31.48	420.08	554.06	623.03
318.00	565.00	560.28	166.90	558.37	31.57	419.29	554.12	623.16
319.00	565.11	560.35	167.40	558.39	31.57	420.86	554.19	623.26
320.00	565.14	560.44	167.04	558.50	31.53	421.53	554.16	623.36
321.00	565.27	560.55	167.22	558.68	31.56	422.12	554.47	623.44
322.00	565.43	560.63	167.09	558.69	31.53	422.19	554.67	623.53
323.00	565.43	560.71	167.05	558.83	31.50	425.02	554.77	623.58
324.00	565.46	560.78	167.33	558.80	31.44	424.11	554.75	623.67
325.00	565.52	560.88	167.17	558.91	31.46	423.34	554.72	623.77
326.00	565.59	560.98	167.43	559.08	31.40	424.63	554.94	623.84
327.00	565.75	561.07	167.98	559.13	31.42	421.60	554.99	623.92
328.00	565.72	561.13	166.79	559.17	31.44	426.18	555.17	623.94
329.00	565.86	561.23	167.42	559.29	31.52	423.92	555.17	624.00
330.00	565.88	561.29	167.66	559.34	31.51	427.37	555.30	624.08
331.00	565.92	561.36	167.46	559.40	31.56	428.52	555.46	624.17
332.00	565.95	561.43	168.31	559.46	31.52	424.75	555.43	624.27
333.00	566.13	561.52	166.92	559.56	31.54	422.66	555.50	624.36
334.00	566.06	561.57	167.55	559.64	31.61	422.14	555.52	623.59
335.00	564.28	560.87	167.62	559.38	31.66	421.04	555.27	609.37
336.00	561.71	559.06	166.06	558.07	31.68	417.81	553.95	591.63
337.00	558.63	556.52	162.29	555.84	31.53	412.31	551.53	578.47
338.00	555.43	553.53	157.52	553.04	31.68	402.84	548.72	568.63
339.00	551.99	550.19	156.50	549.77	31.57	401.21	545.51	560.92
340.00	548.38	546.64	155.13	546.28	31.65	402.74	542.11	554.67
341.00	544.68	542.98	152.76	542.67	31.56	395.92	538.77	549.30
342.00	540.93	539.26	151.27	538.97	31.71	394.84	535.29	544.53
343.00	537.21	535.56	149.23	535.31	31.52	386.85	531.93	540.20
344.00	533.52	531.87	147.58	531.58	31.48	384.88	528.42	536.22
345.00	529.94	528.20	146.48	527.89	31.43	383.09	525.07	532.42
346.00	526.28	524.62	145.37	524.31	31.34	377.83	521.62	528.76
347.00	522.76	521.06	143.48	520.73	31.31	373.30	518.31	525.23
348.00	519.21	517.52	142.28	517.13	31.19	370.22	514.93	521.76
349.00	515.73	514.01	141.62	513.56	31.27	368.65	511.48	518.38
350.00	512.32	510.54	140.68	510.11	31.22	362.72	508.28	514.99
351.00	508.89	507.11	139.33	506.63	31.04	361.73	504.98	511.63
352.00	505.51	503.74	138.09	503.27	31.17	356.72	501.66	508.35
353.00	502.22	500.40	136.78	499.88	31.15	355.27	498.43	505.09
354.00	498.89	497.07	136.11	496.53	30.99	352.49	495.15	501.82
355.00	495.59	493.78	135.16	493.22	31.09	350.12	491.88	498.61
356.00	492.34	490.51	134.28	489.98	31.04	345.50	488.76	495.38
357.00	489.08	487.25	133.28	486.73	31.05	343.66	485.54	492.19
358.00	485.89	484.04	132.34	483.54	30.99	339.95	482.48	489.05
359.00	482.71	480.87	131.61	480.33	30.86	335.00	479.36	485.91
360.00	479.59	477.74	130.78	477.18	30.87	334.43	476.26	482.79
361.00	476.47	474.66	129.91	474.07	30.89	331.41	473.16	479.71
362.00	473.38	471.59	128.66	470.96	30.81	327.32	470.08	476.64
363.00	470.33	468.51	127.64	467.82	30.72	325.61	467.04	473.58
364.00	467.24	465.45	126.88	464.79	30.72	321.64	464.01	470.56
365.00	464.21	462.41	125.86	461.74	30.68	319.77	461.03	467.56
366.00	461.18	459.38	125.35	458.73	30.73	315.86	458.10	464.56
367.00	458.16	456.41	124.21	455.74	30.70	315.24	455.04	461.59
368.00	455.17	453.46	123.78	452.81	30.73	311.26	452.09	458.65
369.00	452.26	450.54	122.46	449.89	30.71	308.68	449.24	455.71
370.00	449.36	447.64	121.81	446.98	30.74	308.59	446.26	452.80
371.00	446.51	444.76	120.89	444.09	30.72	303.64	443.50	449.91
372.00	443.57	441.89	119.85	441.25	30.76	303.57	440.49	447.03
373.00	440.76	439.06	119.18	438.42	30.73	298.56	437.83	444.17
374.00	437.89	436.23	118.46	435.60	30.73	294.36	434.98	441.35
375.00	435.09	433.42	117.49	432.81	30.86	295.28	432.19	438.54
376.00	432.33	430.63	116.71	430.00	30.85	293.87	429.38	435.78
377.00	429.56	427.89	115.73	427.27	30.84	289.08	426.68	433.03

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378.00	426.85	425.17	115.36	424.56	30.83	286.41	424.03	430.28
379.00	424.17	422.47	114.67	421.83	30.62	282.84	421.38	427.57
380.00	421.43	419.79	114.01	419.15	30.63	283.37	418.59	424.89
381.00	418.79	417.12	113.47	416.47	30.57	279.54	416.02	422.21
382.00	416.16	414.47	112.60	413.82	30.57	276.82	413.37	419.57
383.00	413.52	411.87	111.92	411.22	30.55	275.39	410.74	416.94
384.00	410.92	409.28	110.90	408.61	30.64	273.83	408.12	414.32
385.00	408.33	406.69	110.60	406.08	30.68	273.14	405.61	411.72
386.00	405.78	404.13	109.61	403.53	30.59	267.52	403.16	409.15
387.00	403.19	401.59	108.92	401.00	30.51	267.77	400.57	406.59
388.00	400.68	399.10	108.08	398.51	30.48	264.42	398.12	404.08
389.00	398.21	396.62	107.74	396.02	30.59	263.60	395.63	401.59
390.00	395.71	394.14	107.27	393.53	30.57	261.51	393.13	399.11
391.00	393.26	391.72	106.34	391.09	30.59	258.20	390.74	396.65
392.00	390.83	389.29	105.64	388.66	30.52	256.04	388.36	394.21
393.00	388.41	386.87	105.26	386.24	30.51	254.63	385.96	391.78
394.00	386.01	384.49	104.57	383.86	30.59	252.26	383.53	389.39
395.00	383.66	382.15	103.98	381.49	30.52	250.10	381.22	387.02
396.00	381.31	379.80	103.11	379.13	30.51	246.81	378.93	384.63
397.00	378.98	377.48	102.64	376.82	30.49	246.74	376.55	382.31
398.00	376.67	375.17	101.82	374.53	30.48	244.39	374.24	379.99
399.00	374.34	372.86	101.40	372.24	30.46	243.06	372.02	377.66
400.00	372.06	370.59	100.87	369.99	30.48	243.08	369.69	375.38
401.00	369.82	368.34	100.10	367.77	30.46	240.87	367.52	373.12
402.00	367.57	366.11	99.43	365.52	30.47	240.07	365.26	370.88
403.00	365.38	363.93	99.03	363.31	30.46	236.78	363.12	368.66
404.00	363.19	361.75	98.46	361.12	30.47	233.43	360.96	366.47
405.00	361.00	359.57	97.91	358.94	30.53	232.93	358.77	364.28
406.00	358.85	357.42	97.65	356.79	30.49	231.06	356.66	362.10
407.00	356.71	355.29	96.62	354.65	30.38	228.95	354.54	359.95
408.00	354.58	353.17	95.94	352.51	30.47	228.91	352.42	357.82
409.00	352.48	351.08	95.47	350.42	30.43	226.77	350.33	355.71
410.00	350.41	349.01	95.54	348.33	30.42	226.24	348.26	353.63
411.00	348.32	346.94	95.04	346.27	30.44	222.80	346.22	351.52
412.00	346.26	344.88	94.23	344.21	30.29	222.24	344.17	349.43
413.00	344.22	342.86	93.42	342.19	30.40	218.48	342.13	347.37
414.00	342.21	340.87	93.00	340.20	30.48	220.39	340.07	345.34
415.00	340.19	338.86	92.65	338.18	30.32	216.16	338.09	343.30
416.00	338.19	336.88	92.04	336.19	30.31	213.87	336.14	341.30
417.00	336.20	334.90	91.82	334.22	30.28	213.08	334.20	339.31
418.00	334.20	332.91	91.37	332.26	30.31	210.51	332.24	337.32
419.00	332.26	330.96	90.90	330.32	30.32	212.48	330.27	335.37
420.00	330.31	329.06	90.39	328.42	30.34	209.08	328.38	333.42
421.00	328.42	327.15	89.67	326.49	30.33	208.66	326.46	331.49
422.00	326.52	325.27	89.30	324.62	30.32	205.68	324.59	329.57
423.00	324.65	323.38	88.99	322.74	30.36	204.53	322.73	327.69
424.00	322.76	321.51	88.17	320.89	30.34	202.27	320.93	325.78
425.00	320.91	319.66	88.03	319.05	30.28	201.65	319.07	323.93
426.00	319.07	317.83	87.68	317.22	30.22	199.35	317.29	322.08
427.00	317.24	316.00	87.21	315.38	30.17	197.12	315.47	320.24
428.00	315.41	314.19	86.78	313.59	30.24	198.19	313.64	318.44
429.00	313.62	312.40	85.99	311.82	30.32	196.53	311.86	316.63
430.00	311.82	310.61	85.56	310.04	30.20	195.41	310.11	314.81
431.00	310.07	308.86	84.98	308.27	30.22	193.43	308.32	313.05
432.00	308.32	307.12	84.66	306.53	30.27	191.44	306.63	311.29
433.00	306.58	305.38	84.49	304.80	30.28	190.96	304.89	309.54
434.00	304.87	303.69	84.23	303.10	30.21	188.81	303.18	307.81
435.00	303.17	301.99	83.55	301.41	30.19	187.48	301.50	306.07
436.00	301.48	300.30	83.48	299.72	30.19	186.02	299.82	304.36
437.00	299.79	298.61	82.87	298.03	30.14	186.16	298.11	302.67
438.00	298.13	296.95	82.32	296.36	30.19	185.53	296.45	300.99
439.00	296.46	295.29	81.78	294.69	30.17	185.07	294.79	299.32
440.00	294.81	293.64	81.33	293.06	30.22	182.87	293.17	297.67

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441.00	293.17	292.02	81.12	291.43	30.20	182.37	291.57	296.03
442.00	291.53	290.39	80.72	289.82	30.24	181.61	289.93	294.37
443.00	289.96	288.83	80.26	288.23	30.14	178.43	288.35	292.75
444.00	288.37	287.26	80.13	286.64	30.13	177.27	286.78	291.15
445.00	286.78	285.64	79.81	285.06	30.13	177.43	285.22	289.54
446.00	285.18	284.08	79.34	283.52	30.11	178.89	283.54	287.96
447.00	283.63	282.54	78.90	281.97	30.07	173.96	282.14	286.38
448.00	282.10	281.01	78.81	280.42	30.01	175.02	280.56	284.82
449.00	280.58	279.50	78.31	278.87	30.02	172.31	279.03	283.30
450.00	279.06	277.97	78.05	277.35	29.96	171.74	277.56	281.76
451.00	277.58	276.46	77.74	275.84	29.99	171.44	276.08	280.25
452.00	276.06	274.97	77.26	274.36	30.08	170.73	274.54	278.74
453.00	274.53	273.46	76.79	272.88	30.03	169.21	273.03	277.22
454.00	273.03	271.96	76.55	271.39	30.07	168.53	271.54	275.72
455.00	271.57	270.49	76.46	269.94	29.92	166.17	270.21	274.22
456.00	270.10	269.04	76.07	268.48	29.87	164.88	268.74	272.76
457.00	268.61	267.58	75.83	267.06	29.89	164.52	267.29	271.28
458.00	267.21	266.15	75.47	265.63	29.85	160.86	265.96	269.84
459.00	265.78	264.73	75.16	264.21	29.88	162.82	264.48	268.42
460.00	264.38	263.34	74.64	262.80	29.91	161.62	263.09	267.01
461.00	263.00	261.96	74.47	261.41	29.87	161.45	261.73	265.59
462.00	261.62	260.58	74.31	260.03	30.02	160.38	260.30	264.18
463.00	260.21	259.19	73.95	258.67	29.84	160.60	258.92	262.77
464.00	258.85	257.84	73.67	257.31	29.90	158.01	257.59	261.38
465.00	257.49	256.49	73.30	255.98	29.89	156.06	256.26	260.02
466.00	256.14	255.13	73.12	254.63	29.88	155.21	254.89	258.66
467.00	254.78	253.79	72.62	253.31	29.92	154.47	253.54	257.30
468.00	253.46	252.47	72.03	251.99	29.88	152.43	252.28	255.96
469.00	252.14	251.14	71.88	250.65	29.91	156.27	250.84	254.64
470.00	250.85	249.85	71.56	249.33	29.82	151.54	249.65	253.29
471.00	249.54	248.56	71.50	248.02	29.80	151.88	248.31	251.99
472.00	248.26	247.27	71.39	246.69	29.81	150.67	247.02	250.69
473.00	246.98	246.00	70.67	245.43	29.87	151.55	245.69	249.41
474.00	245.71	244.72	70.57	244.15	29.87	150.86	244.41	248.11
475.00	244.41	243.44	70.09	242.89	29.80	148.96	243.17	246.79
476.00	243.16	242.19	69.72	241.64	29.77	147.86	241.97	245.53
477.00	241.93	240.97	69.53	240.38	29.67	146.42	240.72	244.27
478.00	240.69	239.73	69.20	239.13	29.70	144.20	239.52	243.03
479.00	239.46	238.49	68.95	237.91	29.70	145.95	238.25	241.80
480.00	238.23	237.26	68.80	236.70	29.77	145.09	237.08	240.57
481.00	237.01	236.04	68.57	235.48	29.69	144.65	235.84	239.34
482.00	235.82	234.84	68.23	234.28	29.65	143.26	234.70	238.12
483.00	234.63	233.65	68.03	233.07	29.63	142.20	233.48	236.92
484.00	233.44	232.47	67.84	231.87	29.56	140.57	232.31	235.72
485.00	232.27	231.30	67.48	230.71	29.63	141.10	231.13	234.54
486.00	231.11	230.15	67.21	229.54	29.58	138.92	229.97	233.36
487.00	229.94	228.99	67.15	228.38	29.58	138.57	228.82	232.17
488.00	228.78	227.83	67.09	227.26	29.59	138.92	227.66	231.01
489.00	227.60	226.68	66.69	226.13	29.54	137.39	226.52	229.83
490.00	226.44	225.53	66.48	225.01	29.56	136.78	225.42	228.67
491.00	225.31	224.41	66.25	223.91	29.59	136.82	224.29	227.51
492.00	224.17	223.29	65.89	222.79	29.62	135.61	223.17	226.37
493.00	223.04	222.17	65.51	221.68	29.62	135.01	222.06	225.23
494.00	221.97	221.07	65.28	220.60	29.60	135.01	220.98	224.13
495.00	220.87	220.01	64.99	219.50	29.56	133.36	219.87	223.03
496.00	219.81	218.94	64.64	218.38	29.51	133.21	218.79	221.94
497.00	218.73	217.86	64.88	217.28	29.72	133.92	217.62	220.86
498.00	217.67	216.79	64.62	216.22	29.82	133.01	216.60	219.76
499.00	216.56	215.72	64.48	215.16	29.85	132.86	215.46	218.64

APPENDIX E

1000 F Second Text File for Fortran Program

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0.0	-1.7983	-1.7983	-.00038	235.7450	-42434.0953	177.2152
1.0	-1.7711	-1.8428	-.00024	251.4613	-6466.1479	189.0295
2.0	6.7847	7.9301	0.00891	479.3481	86282.6604	360.3376
3.0	63.5144	77.7727	0.01797	1823.0946	5757.1404	1370.4641
4.0	126.7427	126.0424	0.01956	3213.9900	2741.7923	2416.0338
5.0	174.7803	93.6323	0.01863	4518.4455	1998.3296	3396.6245
6.0	209.7664	58.2684	0.01703	5783.6103	1663.0189	4347.6793
7.0	235.0931	39.1098	0.01523	7080.2077	1520.8083	5322.3629
8.0	253.4717	28.9315	0.01375	8266.7908	1382.9203	6214.3460
9.0	267.7904	23.2188	0.01255	9335.5014	1224.7742	7017.7215
10.0	279.6976	19.8133	0.01161	10247.0487	1067.4009	7702.9536
11.0	289.8474	17.5076	0.01090	10985.7163	927.4995	8258.2279
12.0	298.9072	15.7827	0.01028	11653.6604	817.8007	8760.3376
13.0	307.0407	14.4376	0.00971	12282.3137	735.7126	9232.9114
14.0	316.3049	13.8663	0.00927	12785.2364	656.5884	9610.9705
15.0	324.7517	13.2642	0.00890	13217.4355	604.4559	9935.8650
16.0	332.9805	12.7660	0.00859	13563.1948	548.1309	10195.7806
17.0	342.3128	12.6315	0.00836	13806.7980	498.6404	10378.9030
18.0	351.0729	12.3860	0.00813	14058.2593	470.1759	10567.9325
19.0	359.4107	12.1150	0.00795	14231.1389	434.4649	10697.8903
20.0	367.6940	11.8484	0.00776	14443.3094	410.7751	10857.3840
21.0	377.1354	11.8720	0.00762	14576.8982	396.3507	10957.8059
22.0	385.3914	11.6746	0.00754	14592.6146	364.7140	10969.6203
23.0	393.7428	11.5167	0.00744	14663.3381	349.0347	11022.7848
24.0	402.4076	11.4393	0.00735	14710.4871	330.2429	11058.2279
25.0	411.2767	11.4015	0.00730	14686.9126	308.4046	11040.5064
26.0	419.5873	11.2995	0.00726	14655.4799	296.4030	11016.8777
27.0	428.1567	11.2492	0.00721	14631.9054	280.8727	10999.1561
28.0	436.3719	11.1556	0.00715	14624.0472	269.7334	10993.2490
29.0	444.4917	11.0708	0.00707	14663.3381	263.2556	11022.7848
30.0	452.3118	10.9401	0.00699	14726.2034	252.1850	11070.0422
31.0	460.9629	10.9276	0.00691	14773.3524	247.5981	11105.4853
32.0	469.8593	10.9780	0.00683	14820.5014	243.2027	11140.9283
33.0	477.2025	10.8359	0.00676	14836.2177	234.9155	11152.7426
34.0	485.1180	10.7711	0.00670	14851.9341	228.1014	11164.5570
35.0	493.7419	10.7961	0.00664	14875.5086	223.0397	11182.2785
36.0	500.8672	10.6593	0.00658	14891.2249	216.2501	11194.0929
37.0	509.0551	10.6275	0.00653	14906.9412	211.9470	11205.9072
38.0	516.0714	10.4739	0.00646	14938.3739	208.7985	11229.5359
39.0	524.3819	10.4795	0.00640	14985.5229	205.2655	11264.9789
40.0	532.1884	10.4453	0.00635	14985.5229	199.7478	11264.9789
41.0	539.5589	10.3706	0.00628	15056.2464	197.6173	11318.1435
42.0	548.0465	10.4005	0.00623	15071.9627	195.5000	11329.9578
43.0	555.4443	10.3210	0.00618	15119.1117	191.5832	11365.4009
44.0	563.9864	10.3801	0.00615	15079.8209	187.6767	11335.8650
45.0	571.3706	10.3312	0.00611	15119.1117	185.0942	11365.4009
46.0	578.0871	10.2065	0.00607	15142.6862	183.3502	11383.1224
47.0	586.7110	10.2572	0.00603	15166.2607	180.5149	11400.8439
48.0	593.2368	10.1321	0.00598	15221.2679	177.9687	11442.1941
49.0	601.0569	10.1444	0.00595	15221.2679	173.9021	11442.1941
50.0	608.0868	10.0769	0.00593	15221.2679	173.2862	11442.1941
51.0	615.3075	10.0422	0.00588	15284.1332	171.6247	11489.4515
52.0	621.8606	9.9542	0.00583	15346.9985	169.1233	11536.7089
53.0	629.2719	9.9533	0.00580	15370.5730	166.6689	11554.4304
54.0	636.4381	9.9435	0.00577	15402.0057	167.0701	11578.0591
55.0	642.9094	9.8808	0.00572	15472.7292	163.9832	11631.2237
56.0	650.1028	9.8733	0.00569	15512.0200	165.6775	11660.7595
57.0	656.2744	9.8049	0.00564	15567.0272	163.4524	11702.1097
58.0	663.6040	9.8207	0.00561	15629.8925	162.4541	11749.3671
59.0	669.6666	9.7564	0.00558	15653.4670	159.8198	11767.0886
60.0	676.2197	9.7274	0.00555	15677.0415	158.8979	11784.8102
61.0	682.2142	9.6646	0.00553	15708.4742	158.1036	11808.4389
62.0	688.9444	9.6626	0.00549	15763.4813	157.3987	11849.7891

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63.0	695.6201	9.6703	0.00544	15849.9212	158.9319	11914.7680
64.0	701.6963	9.6438	0.00541	15897.0702	156.1513	11950.2110
65.0	709.3257	9.7190	0.00541	15834.2048	155.0599	11902.9536
66.0	713.6853	9.5847	0.00536	15944.2192	155.3429	11985.6540
67.0	720.2656	9.6014	0.00534	15952.0773	153.7879	11991.5612
68.0	725.5108	9.5385	0.00532	15959.9355	153.1255	11997.4684
69.0	731.9412	9.5595	0.00529	16007.0845	151.7739	12032.9114
70.0	737.8949	9.5541	0.00524	16109.2406	153.4701	12109.7047
71.0	744.0528	9.5630	0.00523	16101.3825	152.2909	12103.7975
72.0	752.3575	9.5182	0.00522	16093.5243	150.2975	12097.8903
73.0	764.1541	9.6308	0.00522	16062.0916	149.2066	12074.2616
74.0	776.0231	9.7545	0.00518	16132.8151	149.8172	12127.4262
75.0	786.8020	9.7310	0.00516	16179.9641	150.0538	12162.8692
76.0	797.7830	9.7482	0.00513	16219.2550	147.8211	12192.4051
77.0	808.8791	9.7789	0.00508	16344.9856	148.4558	12286.9199
78.0	819.7048	9.8077	0.00506	16399.9928	148.2597	12328.2701
79.0	830.9708	9.8984	0.00506	16368.5601	147.3170	12304.6414
80.0	842.0733	9.9726	0.00502	16447.1418	146.4572	12363.7131
81.0	852.6804	9.9826	0.00500	16470.7163	146.4425	12381.4346
82.0	863.2106	10.0024	0.00499	16502.1489	147.1435	12405.0633
83.0	874.0425	10.0600	0.00497	16517.8653	147.1161	12416.8777
84.0	885.0618	10.1517	0.00495	16580.7306	146.4657	12464.1351
85.0	895.4732	10.1803	0.00493	16604.3051	146.1146	12481.8566
86.0	905.7050	10.1943	0.00491	16627.8796	144.4158	12499.5781
87.0	916.1994	10.2521	0.00490	16659.3123	144.5215	12523.2068
88.0	926.7995	10.3188	0.00490	16620.0214	143.9863	12493.6709
89.0	937.3279	10.3865	0.00489	16659.3123	143.2717	12523.2068
90.0	946.4733	10.3145	0.00486	16722.1776	143.3329	12570.4642
91.0	956.6147	10.3661	0.00486	16706.4613	142.3509	12558.6498
92.0	966.9372	10.4484	0.00484	16730.0358	142.6125	12576.3713
93.0	977.2091	10.5372	0.00483	16753.6103	143.3498	12594.0929
94.0	986.6219	10.5358	0.00484	16698.6031	141.6870	12552.7427
95.0	996.0795	10.5368	0.00480	16808.6174	142.3119	12635.4431
96.0	1005.8961	10.6201	0.00478	16855.7664	141.6914	12670.8861
97.0	1015.4193	10.6450	0.00480	16785.0429	141.2684	12617.7216
98.0	1024.8205	10.6746	0.00478	16840.0501	141.4404	12659.0718
99.0	1033.8040	10.6859	0.00475	16895.0573	141.9289	12700.4220
100.0	1043.3994	10.7487	0.00472	16989.3553	143.1620	12771.3081
101.0	1053.0867	10.8200	0.00478	16769.3266	140.4205	12605.9072
102.0	1061.9351	10.8201	0.00473	16934.3481	140.9499	12729.9578
103.0	1070.8233	10.8444	0.00473	16918.6318	140.3647	12718.1435
104.0	1079.8101	10.8901	0.00473	16918.6318	140.8973	12718.1435
105.0	1088.5957	10.9102	0.00472	16910.7736	138.5813	12712.2363
106.0	1097.7191	10.9802	0.00471	16918.6318	138.4000	12718.1435
107.0	1106.5431	11.0281	0.00468	17044.3624	141.3297	12812.6583
108.0	1115.0239	11.0471	0.00469	16997.2134	138.6019	12777.2152
109.0	1123.4935	11.0586	0.00470	16950.0644	138.8148	12741.7722
110.0	1132.6384	11.1566	0.00469	16950.0644	139.8841	12741.7722
111.0	1140.8463	11.1756	0.00470	16902.9154	139.2205	12706.3291
112.0	1148.5770	11.1573	0.00469	16926.4899	137.2789	12724.0507
113.0	1156.5211	11.1693	0.00466	17036.5042	137.3665	12806.7511
114.0	1164.8358	11.2015	0.00468	16965.7808	137.8647	12753.5865
115.0	1173.4379	11.2722	0.00469	16934.3481	138.9073	12729.9578
116.0	1181.2888	11.2671	0.00468	16957.9226	137.1014	12747.6794
117.0	1188.8299	11.2543	0.00469	16918.6318	136.2879	12718.1435
118.0	1196.8394	11.2892	0.00469	16918.6318	135.3430	12718.1435
119.0	1204.5201	11.3195	0.00467	16981.4971	136.3367	12765.4009
120.0	1211.9049	11.3527	0.00465	17028.6461	135.7525	12800.8439
121.0	1219.0204	11.3544	0.00464	17060.0787	136.7724	12824.4726
122.0	1226.9423	11.4323	0.00467	16950.0644	137.0871	12741.7722
123.0	1233.9282	11.4288	0.00467	16942.2063	136.3680	12735.8650
124.0	1241.4270	11.4799	0.00466	16973.6389	136.8535	12759.4937
125.0	1248.4893	11.4986	0.00465	16989.3553	135.5894	12771.3081

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126.0	1255.3300	11.4963	0.00465	17012.9297	136.2245	12789.0296
127.0	1261.8962	11.4764	0.00465	16989.3553	135.8002	12771.3081
128.0	1269.5603	11.5590	0.00466	16942.2063	134.9738	12735.8650
129.0	1276.5072	11.5894	0.00463	17044.3624	134.7735	12812.6583
130.0	1282.5878	11.5554	0.00462	17107.2277	135.0511	12859.9156
131.0	1289.9379	11.6397	0.00464	17020.7879	135.3362	12794.9367
132.0	1296.8206	11.6720	0.00466	16942.2063	135.1352	12735.8650
133.0	1303.1552	11.6782	0.00464	17012.9297	134.6196	12789.0296
134.0	1309.8719	11.7238	0.00465	16965.7808	134.0403	12753.5865
135.0	1315.6123	11.6961	0.00465	16965.7808	133.4137	12753.5865
136.0	1321.9569	11.7293	0.00464	16989.3553	133.6867	12771.3081
137.0	1328.5028	11.7798	0.00464	16981.4971	134.2824	12765.4009
138.0	1334.0133	11.7534	0.00465	16902.9154	133.3446	12706.3291
139.0	1340.0997	11.7892	0.00466	16871.4828	133.5356	12682.7005
140.0	1345.7937	11.7863	0.00463	17020.7879	134.5635	12794.9367
141.0	1352.0096	11.8390	0.00467	16840.0501	132.6568	12659.0718
142.0	1357.8077	11.8569	0.00466	16879.3409	132.2544	12688.6076
143.0	1363.7819	11.9033	0.00465	16895.0573	133.3119	12700.4220
144.0	1368.9349	11.8860	0.00464	16918.6318	132.6662	12718.1435
145.0	1374.1709	11.8685	0.00464	16918.6318	132.1080	12718.1435
146.0	1379.3807	11.8481	0.00463	16934.3481	131.8076	12729.9578
147.0	1384.9643	11.8819	0.00460	17052.2206	131.6378	12818.5654
148.0	1390.3367	11.9007	0.00461	17012.9297	132.7464	12789.0296
149.0	1396.8602	12.0177	0.00463	16950.0644	131.7419	12741.7722
150.0	1401.2300	11.9548	0.00464	16942.2063	132.3840	12735.8650
151.0	1405.9024	11.9324	0.00466	16816.4756	131.5100	12641.3502
152.0	1411.4276	11.9963	0.00463	16942.2063	133.1702	12735.8650
153.0	1416.4787	12.0052	0.00463	16918.6318	131.9077	12718.1435
154.0	1421.6175	12.0465	0.00463	16942.2063	132.4817	12735.8650
155.0	1426.4539	12.0585	0.00463	16895.0573	130.5814	12700.4220
156.0	1430.9371	12.0579	0.00465	16847.9083	131.1575	12664.9789
157.0	1435.5735	12.0541	0.00465	16832.1919	130.9955	12653.1646
158.0	1439.7770	12.0338	0.00465	16816.4756	130.9241	12641.3502
159.0	1445.3036	12.1092	0.00464	16847.9083	131.3336	12664.9789
160.0	1449.8746	12.1334	0.00467	16737.8939	131.0549	12582.2785
161.0	1453.6072	12.0843	0.00465	16792.9011	130.8991	12623.6287
162.0	1458.1725	12.1066	0.00465	16792.9011	130.5148	12623.6287
163.0	1462.5678	12.1313	0.00464	16832.1919	129.1032	12653.1646
164.0	1467.3321	12.1804	0.00467	16706.4613	129.6974	12558.6498
165.0	1471.6076	12.1895	0.00466	16753.6103	130.7117	12594.0929
166.0	1475.4789	12.1672	0.00467	16714.3194	129.8536	12564.5570
167.0	1479.7751	12.1881	0.00468	16690.7449	128.4068	12546.8355
168.0	1483.1150	12.1600	0.00465	16777.1848	129.6871	12611.8144
169.0	1487.3913	12.2229	0.00465	16777.1848	127.8424	12611.8144
170.0	1491.4107	12.2470	0.00466	16737.8939	128.5882	12582.2785
171.0	1494.8853	12.2364	0.00465	16737.8939	128.7530	12582.2785
172.0	1498.2432	12.2294	0.00461	16879.3409	129.8577	12688.6076
173.0	1502.1381	12.2468	0.00466	16690.7449	129.6760	12546.8355
174.0	1505.6436	12.2421	0.00466	16698.6031	129.2073	12552.7427
175.0	1509.5309	12.2676	0.00464	16753.6103	128.9400	12594.0929
176.0	1513.4885	12.3053	0.00467	16651.4541	126.7287	12517.2996
177.0	1516.2948	12.2589	0.00471	16510.0071	127.8744	12410.9705
178.0	1520.2475	12.2914	0.00471	16494.2908	128.3380	12399.1562
179.0	1524.1406	12.3290	0.00470	16565.0143	127.1840	12452.3207
180.0	1527.5127	12.3386	0.00466	16706.4613	127.7252	12558.6498
181.0	1530.5975	12.3214	0.00465	16698.6031	126.9159	12552.7427
182.0	1533.8618	12.3323	0.00463	16785.0429	126.4516	12617.7216
183.0	1536.7840	12.3112	0.00467	16627.8796	126.5012	12499.5781
184.0	1540.1598	12.3328	0.00462	16816.4756	125.8875	12641.3502
185.0	1543.3927	12.3411	0.00464	16714.3194	125.9873	12564.5570
186.0	1544.7309	12.2043	0.00464	16714.3194	126.3259	12564.5570
187.0	1547.5715	12.1941	0.00465	16675.0286	125.6701	12535.0211
188.0	1552.8723	12.3582	0.00464	16737.8939	126.5200	12582.2785

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189.0	1556.0976	12.3707	0.00469	16565.0143	127.6414	12452.3207
190.0	1558.5952	12.3404	0.00472	16462.8581	127.4489	12375.5275
191.0	1561.8982	12.3633	0.00470	16517.8653	126.9195	12416.8777
192.0	1564.2794	12.3188	0.00478	16289.9785	128.6333	12245.5697
193.0	1567.6469	12.3659	0.00471	16510.0071	126.8645	12410.9705
194.0	1571.1115	12.4220	0.00469	16557.1561	127.3900	12446.4135
195.0	1573.5589	12.4027	0.00471	16486.4326	125.3562	12393.2490
196.0	1576.5229	12.4217	0.00469	16557.1561	124.2874	12446.4135
197.0	1579.5348	12.4531	0.00469	16557.1561	124.3756	12446.4135
198.0	1581.9730	12.4472	0.00466	16627.8796	123.7705	12499.5781
199.0	1584.6021	12.4440	0.00466	16690.7449	124.3979	12546.8355
200.0	1586.5463	12.4014	0.00472	16455.0000	124.1210	12369.6203
201.0	1589.7421	12.4550	0.00471	16494.2908	125.2837	12399.1562
202.0	1592.4379	12.4734	0.00470	16502.1489	124.8691	12405.0633
203.0	1595.1086	12.4867	0.00471	16494.2908	125.1833	12399.1562
204.0	1597.5840	12.4882	0.00476	16329.2693	126.5617	12275.1055
205.0	1599.6710	12.4617	0.00476	16337.1275	125.5522	12281.0127
206.0	1601.9732	12.4559	0.00476	16329.2693	124.6721	12275.1055
207.0	1604.6740	12.4872	0.00474	16415.7091	125.7427	12340.0844
208.0	1607.0255	12.4898	0.00476	16313.5530	124.1886	12263.2912
209.0	1609.4434	12.5070	0.00473	16407.8510	123.5841	12334.1772
210.0	1611.7792	12.5111	0.00475	16344.9856	123.8934	12286.9199
211.0	1614.5248	12.5611	0.00473	16407.8510	124.2757	12334.1772
212.0	1616.5025	12.5564	0.00473	16376.4183	123.2751	12310.5486
213.0	1619.0914	12.5907	0.00473	16376.4183	123.5179	12310.5486
214.0	1620.5358	12.5364	0.00472	16407.8510	123.9888	12334.1772
215.0	1622.8073	12.5448	0.00475	16344.9856	123.8256	12286.9199
216.0	1624.8775	12.5435	0.00473	16376.4183	122.7975	12310.5486
217.0	1626.3028	12.5004	0.00476	16297.8366	122.9613	12251.4768
218.0	1629.4721	12.5931	0.00472	16423.5673	123.3824	12345.9916
219.0	1631.4486	12.5883	0.00475	16337.1275	123.1081	12281.0127
220.0	1633.9325	12.6259	0.00477	16242.8295	123.0466	12210.1266
221.0	1635.3678	12.5959	0.00478	16227.1131	123.0777	12198.3123
222.0	1637.4240	12.6166	0.00475	16305.6948	122.3386	12257.3840
223.0	1639.4007	12.6340	0.00477	16227.1131	121.4402	12198.3123
224.0	1641.0724	12.6215	0.00476	16282.1203	123.5991	12239.6625
225.0	1643.3745	12.6603	0.00477	16219.2550	122.1789	12192.4051
226.0	1644.9750	12.6434	0.00479	16187.8223	121.8606	12168.7764
227.0	1646.6549	12.6487	0.00480	16140.6733	120.7381	12133.3334
228.0	1648.2476	12.6324	0.00480	16156.3896	122.4794	12145.1477
229.0	1650.9423	12.6920	0.00482	16054.2335	122.3646	12068.3545
230.0	1652.0665	12.6498	0.00478	16195.6805	124.8971	12174.6836
231.0	1653.8299	12.6644	0.00480	16124.9570	122.1074	12121.5190
232.0	1656.4959	12.7309	0.00480	16117.0988	122.5997	12115.6118
233.0	1657.8897	12.7085	0.00482	16038.5171	122.0639	12056.5401
234.0	1658.7153	12.6373	0.00479	16148.5315	122.3528	12139.2405
235.0	1660.4317	12.6488	0.00483	16062.0916	121.9134	12074.2616
236.0	1662.8262	12.6987	0.00481	16124.9570	123.1278	12121.5190
237.0	1663.9662	12.6746	0.00483	16038.5171	121.1317	12056.5401
238.0	1665.1462	12.6467	0.00481	16101.3825	122.2322	12103.7975
239.0	1666.8803	12.6609	0.00486	15967.7936	121.8554	12003.3756
240.0	1668.1003	12.6467	0.00482	16085.6661	121.6358	12091.9832
241.0	1670.2287	12.7008	0.00479	16156.3896	120.9562	12145.1477
242.0	1671.5125	12.6999	0.00479	16179.9641	121.7352	12162.8692
243.0	1673.4771	12.7406	0.00485	15952.0773	119.3125	11991.5612
244.0	1674.2497	12.6874	0.00486	15912.7865	120.1066	11962.0254
245.0	1676.2480	12.7348	0.00486	15904.9283	120.3096	11956.1182
246.0	1677.4038	12.7247	0.00486	15912.7865	119.5302	11962.0254
247.0	1678.7899	12.7197	0.00483	16038.5171	120.3992	12056.5401
248.0	1680.3791	12.7425	0.00488	15865.6375	119.5802	11926.5823
249.0	1681.6833	12.7443	0.00485	15944.2192	121.6033	11985.6540
250.0	1682.9131	12.7392	0.00486	15936.3610	121.5228	11979.7469
251.0	1683.3716	12.6813	0.00486	15944.2192	118.9670	11985.6540

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252.0	1685.1205	12.7179	0.00484	15975.6518	119.7176	12009.2827
253.0	1686.3023	12.7108	0.00479	16124.9570	118.2952	12121.5190
254.0	1687.8304	12.7309	0.00486	15881.3538	118.6799	11938.3967
255.0	1689.3998	12.7502	0.00485	15952.0773	120.0758	11991.5612
256.0	1691.1049	12.7942	0.00485	15928.5028	121.1600	11973.8397
257.0	1691.5369	12.7460	0.00487	15881.3538	120.1868	11938.3967
258.0	1692.4619	12.7354	0.00488	15842.0630	119.8844	11908.8608
259.0	1693.8402	12.7607	0.00485	15936.3610	120.0931	11979.7469
260.0	1694.6931	12.7426	0.00491	15739.9068	118.7768	11832.0675
261.0	1695.5381	12.7112	0.00489	15826.3467	119.4341	11897.0464
262.0	1696.8304	12.7230	0.00490	15794.9140	119.2619	11873.4178
263.0	1697.4334	12.6769	0.00497	15582.7435	118.9825	11713.9241
264.0	1699.3061	12.7374	0.00493	15724.1905	119.5503	11820.2532
265.0	1699.8256	12.7005	0.00488	15904.9283	120.5629	11956.1182
266.0	1701.4562	12.7407	0.00492	15763.4813	119.1345	11849.7891
267.0	1702.1322	12.7262	0.00493	15684.8997	119.3979	11790.7173
268.0	1703.0566	12.7241	0.00497	15567.0272	118.6762	11702.1097
269.0	1703.7068	12.7111	0.00490	15802.7722	120.3409	11879.3249
270.0	1704.7900	12.7155	0.00508	15276.2750	120.4120	11483.5443
271.0	1705.4256	12.6960	0.00497	15567.0272	119.4961	11702.1097
272.0	1706.2094	12.6971	0.00497	15582.7435	119.9441	11713.9241
273.0	1707.4864	12.7103	0.00499	15535.5945	120.3170	11678.4810
274.0	1708.0958	12.6923	0.00491	15755.6232	118.6715	11843.8819
275.0	1709.7581	12.7256	0.00493	15677.0415	118.8605	11784.8102
276.0	1711.2279	12.7619	0.00493	15684.8997	117.1146	11790.7173
277.0	1712.1986	12.7628	0.00489	15834.2048	118.1216	11902.9536
278.0	1713.0329	12.7732	0.00487	15857.7793	118.4448	11920.6751
279.0	1713.0141	12.7267	0.00489	15794.9140	121.5617	11873.4178
280.0	1713.4542	12.7069	0.00495	15645.6088	120.1711	11761.1815
281.0	1715.1340	12.7577	0.00504	15346.9985	119.6077	11536.7089
282.0	1714.9567	12.6976	0.00498	15543.4527	117.1961	11684.3882
283.0	1717.5049	12.8092	0.00507	15260.5587	118.5082	11471.7300
284.0	1718.4967	12.8310	0.00510	15189.8352	119.0530	11418.5654
285.0	1718.0892	12.7449	0.00501	15449.1547	117.9425	11613.5021
286.0	1718.3889	12.7199	0.00498	15512.0200	118.0868	11660.7595
287.0	1719.9445	12.7782	0.00501	15457.0128	120.9837	11619.4093
288.0	1720.3781	12.7661	0.00501	15441.2965	118.5765	11607.5950
289.0	1721.6650	12.8084	0.00506	15291.9914	119.1945	11495.3587
290.0	1722.9029	12.8511	0.00498	15543.4527	117.6198	11684.3882
291.0	1723.7412	12.8462	0.00499	15472.7292	115.3868	11631.2237
292.0	1724.1114	12.8107	0.00494	15645.6088	117.2639	11761.1815
293.0	1724.1927	12.7823	0.00496	15559.1690	116.5675	11696.2026
294.0	1725.2714	12.8151	0.00493	15653.4670	116.8557	11767.0886
295.0	1725.1840	12.7676	0.00492	15669.1833	116.2498	11778.9030
296.0	1725.9184	12.7762	0.00494	15629.8925	118.3186	11749.3671
297.0	1725.4089	12.7071	0.00494	15606.3180	115.3318	11731.6456
298.0	1726.9368	12.7617	0.00495	15590.6017	116.0447	11719.8313
299.0	1727.2950	12.7241	0.00496	15574.8853	116.5930	11708.0169
300.0	1728.8888	12.7845	0.00498	15496.3037	115.7929	11648.9452
301.0	1729.3147	12.7708	0.00499	15496.3037	116.1545	11648.9452
302.0	1729.3354	12.7433	0.00499	15464.8710	115.0850	11625.3165
303.0	1730.5263	12.7782	0.00499	15480.5873	115.3641	11637.1308
304.0	1732.0677	12.8481	0.00505	15299.8495	114.8733	11501.2659
305.0	1732.4693	12.8294	0.00503	15386.2894	116.0645	11566.2448
306.0	1733.8414	12.8873	0.00505	15307.7077	116.5266	11507.1730
307.0	1733.3119	12.8182	0.00504	15331.2822	116.4156	11524.8945
308.0	1734.2508	12.8326	0.00506	15291.9914	116.3036	11495.3587
309.0	1734.5169	12.8251	0.00504	15354.8567	114.5647	11542.6161
310.0	1734.8916	12.8010	0.00503	15378.4312	115.7627	11560.3376
311.0	1735.4354	12.7992	0.00502	15402.0057	114.4610	11578.0591
312.0	1737.0613	12.8767	0.00506	15284.1332	115.8328	11489.4515
313.0	1737.5887	12.8716	0.00505	15331.2822	116.6320	11524.8945
314.0	1738.2067	12.8767	0.00509	15197.6934	114.6323	11424.4726

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315.0	1737.8358	12.8143	0.00507	15268.4169	115.0500	11477.6372
316.0	1738.3880	12.8247	0.00504	15362.7149	114.7280	11548.5232
317.0	1739.1845	12.8416	0.00504	15331.2822	114.4315	11524.8945
318.0	1739.9908	12.8571	0.00503	15394.1475	114.1811	11572.1519
319.0	1739.8441	12.8087	0.00501	15449.1547	115.8687	11613.5021
320.0	1740.9610	12.8474	0.00498	15535.5945	117.1319	11678.4810
321.0	1741.2011	12.8344	0.00507	15276.2750	115.4233	11483.5443
322.0	1741.9810	12.8507	0.00508	15221.2679	114.8968	11442.1941
323.0	1742.3118	12.8536	0.00513	15071.9627	116.1566	11329.9578
324.0	1742.4683	12.8227	0.00511	15150.5444	115.9727	11389.0296
325.0	1743.3247	12.8459	0.00508	15268.4169	116.2176	11477.6372
326.0	1743.3620	12.8157	0.00515	15056.2464	115.5408	11318.1435
327.0	1742.9755	12.7639	0.00508	15221.2679	114.1120	11442.1941
328.0	1744.9509	12.8927	0.00519	14914.7994	115.6236	11211.8144
329.0	1744.3310	12.8354	0.00512	15119.1117	115.1884	11365.4009
330.0	1744.4525	12.8127	0.00517	14969.8065	117.0176	11253.1646
331.0	1745.3264	12.8422	0.00523	14804.7851	116.6343	11129.1140
332.0	1744.6437	12.7538	0.00522	14875.5086	113.8287	11182.2785
333.0	1747.2750	12.9067	0.00515	15040.5300	113.2238	11306.3291
334.0	1741.6549	12.8120	0.00513	14914.7994	111.8237	11211.8144
335.0	1655.5224	12.1764	0.00471	12745.9455	94.9576	9581.4346
336.0	1553.4917	11.5602	0.00363	10970.0000	80.5795	8246.4135
337.0	1483.6872	11.3465	0.00263	10050.5945	72.1939	7555.2743
338.0	1435.3541	11.4068	0.00185	9492.6647	65.0727	7135.8650
339.0	1394.1892	11.1600	0.00129	9170.4799	63.5515	6893.6709
340.0	1362.0228	11.0305	0.00094	8864.0114	63.6021	6663.2912
341.0	1336.3382	11.0259	0.00074	8361.0888	58.5328	6285.2321
342.0	1312.8696	10.9813	0.00060	7968.1805	56.7310	5989.8734
343.0	1292.6737	10.9812	0.00053	7465.2579	51.4569	5611.8144
344.0	1273.9597	10.9730	0.00050	7213.7965	50.2567	5422.7848
345.0	1255.5478	10.9136	0.00048	6883.7536	48.4828	5174.6836
346.0	1238.0582	10.8580	0.00050	6593.0014	45.8537	4956.1182
347.0	1222.3426	10.8976	0.00052	6294.3911	43.4079	4731.6456
348.0	1206.1016	10.8576	0.00056	6050.7879	41.8129	4548.5232
349.0	1189.7898	10.7814	0.00059	6003.6390	42.0325	4513.0802
350.0	1173.8942	10.7243	0.00062	5705.0286	39.1934	4288.6076
351.0	1158.7391	10.6999	0.00066	5524.2908	38.5640	4152.7426
352.0	1143.9635	10.6985	0.00070	5437.8510	37.5182	4087.7637
353.0	1129.4570	10.6928	0.00071	5351.4112	37.3803	4022.7848
354.0	1114.2126	10.6003	0.00074	5288.5458	37.0721	3975.5274
355.0	1099.7004	10.5678	0.00076	5249.2550	37.0289	3945.9916
356.0	1085.1438	10.5110	0.00080	5076.3753	35.4358	3816.0338
357.0	1070.9811	10.4758	0.00083	5013.5100	35.3354	3768.7764
358.0	1057.0642	10.4304	0.00087	4817.0559	33.7960	3621.0971
359.0	1043.0137	10.3525	0.00090	4738.4742	32.8250	3562.0253
360.0	1029.2569	10.3023	0.00090	4714.8997	33.2425	3544.3038
361.0	1015.8172	10.2591	0.00092	4691.3252	33.0971	3526.5823
362.0	1002.9956	10.2509	0.00093	4675.6089	32.7526	3514.7679
363.0	989.9859	10.2136	0.00093	4652.0344	32.8921	3497.0464
364.0	976.9672	10.1603	0.00097	4573.4527	32.1257	3437.9747
365.0	964.4110	10.1321	0.00099	4494.8710	31.8196	3378.9030
366.0	951.3578	10.0543	0.00103	4353.4241	30.6052	3272.5738
367.0	939.2745	10.0445	0.00104	4408.4312	31.5351	3313.9241
368.0	926.5759	9.9578	0.00107	4345.5659	30.8549	3266.6667
369.0	914.9202	9.9713	0.00107	4274.8424	30.4127	3213.5021
370.0	902.8013	9.9136	0.00105	4376.9986	31.7942	3290.2954
371.0	891.0804	9.8814	0.00106	4259.1261	30.4537	3201.6878
372.0	879.6465	9.8738	0.00106	4345.5659	31.7375	3266.6667
373.0	867.9973	9.8140	0.00110	4141.2536	29.7338	3113.0802
374.0	856.6139	9.7645	0.00112	4117.6791	29.2819	3095.3587
375.0	845.6364	9.7617	0.00112	4101.9627	29.9608	3083.5443
376.0	834.7028	9.7222	0.00110	4164.8281	30.7342	3130.8017
377.0	824.0989	9.7073	0.00113	4078.3882	29.6394	3065.8228

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378.0	812.9901	9.6180	0.00114	3991.9484	29.0066	3000.8439
379.0	802.4125	9.5468	0.00114	3952.6576	28.5322	2971.3080
380.0	791.9803	9.4981	0.00114	4015.5229	29.6945	3018.5654
381.0	781.5308	9.4274	0.00116	3929.0831	28.7892	2953.5865
382.0	771.6205	9.4068	0.00115	3952.6576	28.9466	2971.3080
383.0	761.6194	9.3603	0.00115	3936.9412	29.0871	2959.4937
384.0	752.0673	9.3709	0.00114	3960.5157	29.4925	2977.2152
385.0	741.9647	9.2842	0.00117	3850.5014	29.0677	2894.5148
386.0	734.5707	9.2971	0.00121	3709.0544	27.3462	2788.1857
387.0	729.9794	9.3096	0.00122	3709.0544	27.9296	2788.1857
388.0	725.8786	9.3541	0.00125	3622.6146	27.0962	2723.2068
389.0	720.6198	9.3412	0.00124	3646.1891	27.6168	2740.9283
390.0	715.6880	9.3310	0.00124	3654.0473	27.7628	2746.8355
391.0	711.9278	9.3984	0.00126	3567.6074	26.9174	2681.8565
392.0	707.6499	9.4200	0.00128	3496.8839	26.4270	2628.6920
393.0	702.6364	9.3998	0.00129	3465.4513	26.3889	2605.0633
394.0	698.4675	9.4416	0.00128	3504.7421	26.6971	2634.5992
395.0	694.0806	9.4476	0.00129	3449.7349	26.3093	2593.2490
396.0	690.3885	9.5095	0.00131	3363.2951	25.4549	2528.2700
397.0	685.8381	9.5057	0.00129	3434.0186	26.4551	2581.4346
398.0	682.1461	9.5613	0.00129	3426.1604	26.3844	2575.5274
399.0	677.4731	9.5501	0.00135	3284.7135	25.4706	2469.1983
400.0	673.1816	9.5630	0.00133	3339.7206	26.3778	2510.5485
401.0	669.5168	9.6141	0.00135	3245.4226	25.6240	2439.6625
402.0	665.6749	9.6529	0.00135	3268.9971	26.1125	2457.3840
403.0	661.2062	9.6425	0.00137	3190.4155	25.2517	2398.3122
404.0	657.2417	9.6669	0.00138	3151.1246	24.7093	2368.7764
405.0	653.2227	9.6957	0.00138	3151.1246	25.0409	2368.7764
406.0	648.5088	9.6560	0.00140	3096.1175	24.6495	2327.4262
407.0	645.7704	9.7499	0.00141	3064.6848	24.4025	2303.7975
408.0	642.2010	9.8088	0.00141	3056.8266	24.7494	2297.8903
409.0	638.1819	9.8123	0.00142	3033.2521	24.5486	2280.1688
410.0	632.9095	9.7196	0.00140	3048.9685	24.9881	2291.9831
411.0	628.9450	9.7360	0.00143	2970.3868	24.0680	2232.9114
412.0	625.8251	9.7879	0.00143	2954.6705	24.2319	2221.0971
413.0	622.7734	9.8827	0.00142	2946.8123	23.8319	2215.1899
414.0	618.8224	9.8985	0.00138	3025.3940	25.2795	2274.2616
415.0	614.6672	9.8610	0.00139	2970.3868	24.3619	2232.9114
416.0	611.2476	9.9005	0.00143	2899.6633	23.7148	2179.7468
417.0	606.9152	9.8632	0.00146	2828.9398	23.3561	2126.5823
418.0	603.1550	9.8779	0.00150	2773.9327	22.7870	2085.2321
419.0	599.5174	9.8967	0.00147	2813.2235	23.8825	2114.7679
420.0	595.9889	9.9258	0.00151	2734.6418	22.9235	2055.6962
421.0	593.0189	9.9947	0.00147	2781.7908	23.6145	2091.1392
422.0	589.2178	9.9905	0.00149	2718.9255	22.8641	2043.8819
423.0	585.3486	9.9832	0.00149	2711.0673	22.9352	2037.9747
424.0	582.7056	10.0775	0.00156	2585.3367	21.7876	1943.4599
425.0	578.4958	10.0182	0.00154	2601.0530	22.1513	1955.2743
426.0	574.8174	10.0046	0.00159	2514.6132	21.3203	1890.2954
427.0	571.4659	10.0179	0.00160	2498.8968	21.1145	1878.4810
428.0	568.0872	10.0467	0.00161	2506.7550	21.7139	1884.3882
429.0	565.5941	10.1583	0.00162	2483.1805	21.5305	1866.6667
430.0	562.2017	10.1562	0.00165	2420.3152	21.1013	1819.4093
431.0	559.2998	10.2145	0.00160	2475.3223	21.5454	1860.7595
432.0	555.7713	10.2195	0.00166	2388.8825	20.7398	1795.7806
433.0	551.8748	10.1791	0.00164	2396.7407	21.0374	1801.6878
434.0	548.2781	10.1491	0.00163	2388.8825	20.8859	1795.7806
435.0	545.6896	10.2264	0.00163	2365.3080	20.7453	1778.0591
436.0	541.6570	10.1656	0.00163	2349.5917	20.6467	1766.2447
437.0	539.0139	10.2226	0.00161	2373.1662	21.1974	1783.9662
438.0	536.2619	10.2874	0.00161	2373.1662	21.3959	1783.9662
439.0	533.4827	10.3377	0.00162	2349.5917	21.4129	1766.2447
440.0	530.5127	10.3796	0.00163	2326.0172	21.0892	1748.5232

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441.0	527.0113	10.3493	0.00168	2263.1519	20.7238	1701.2658
442.0	523.9323	10.3795	0.00167	2263.1519	20.8928	1701.2658
443.0	521.0986	10.3977	0.00164	2271.0100	20.6602	1707.1730
444.0	517.4883	10.3498	0.00165	2247.4355	20.5235	1689.4515
445.0	514.3275	10.3533	0.00167	2200.2865	20.4119	1654.0084
446.0	511.6028	10.3914	0.00159	2318.1590	22.1515	1742.6160
447.0	508.8099	10.4193	0.00173	2113.8467	19.5395	1589.0295
448.0	505.2132	10.3527	0.00166	2176.7120	20.6237	1636.2869
449.0	502.7064	10.4104	0.00165	2192.4284	20.5433	1648.1013
450.0	499.5593	10.3882	0.00169	2121.7049	20.0497	1594.9367
451.0	496.6029	10.3989	0.00168	2121.7049	20.2764	1594.9367
452.0	494.0961	10.4743	0.00165	2153.1375	20.7420	1618.5654
453.0	491.4940	10.5107	0.00168	2121.7049	20.4348	1594.9367
454.0	488.4150	10.5073	0.00169	2113.8467	20.5217	1589.0295
455.0	484.9681	10.4195	0.00184	1917.3925	18.4286	1441.3502
456.0	482.3251	10.4399	0.00184	1917.3925	18.4611	1441.3502
457.0	479.3006	10.4334	0.00191	1862.3854	18.1215	1400.0000
458.0	476.6440	10.4476	0.00198	1768.0874	16.8238	1329.1139
459.0	473.9464	10.4688	0.00192	1830.9527	18.0094	1376.3713
460.0	471.7394	10.5469	0.00193	1815.2364	17.8880	1364.5570
461.0	468.7013	10.5103	0.00192	1799.5201	17.9454	1352.7426
462.0	465.6359	10.5149	0.00183	1862.3854	18.6383	1400.0000
463.0	463.0337	10.4983	0.00186	1830.9527	18.6230	1376.3713
464.0	460.3362	10.5180	0.00190	1775.9456	17.8338	1335.0211
465.0	457.8975	10.5493	0.00193	1744.5129	17.4103	1311.3924
466.0	454.9820	10.5225	0.00190	1760.2292	17.6572	1323.2068
467.0	452.8976	10.6079	0.00192	1744.5129	17.6075	1311.3924
468.0	451.0447	10.6995	0.00200	1665.9312	16.6834	1252.3207
469.0	448.1701	10.6778	0.00181	1838.8109	19.4435	1382.2785
470.0	445.6769	10.6792	0.00192	1697.3639	17.3014	1275.9494
471.0	442.6252	10.6145	0.00186	1752.3711	18.1739	1317.2996
472.0	439.6961	10.5739	0.00183	1760.2292	18.2702	1323.2068
473.0	438.3337	10.7435	0.00176	1830.9527	19.4495	1376.3713
474.0	435.3773	10.6972	0.00174	1830.9527	19.5719	1376.3713
475.0	433.3337	10.7557	0.00181	1752.3711	18.5994	1317.2996
476.0	431.1403	10.7905	0.00187	1689.5057	17.9522	1270.0422
477.0	428.5245	10.7519	0.00182	1713.0802	18.1663	1287.7637
478.0	426.2766	10.7918	0.00187	1658.0731	17.3944	1246.4135
479.0	423.8788	10.7995	0.00183	1705.2221	18.4748	1281.8565
480.0	421.2358	10.7917	0.00191	1626.6404	17.6830	1222.7848
481.0	418.7835	10.7703	0.00189	1650.2149	18.0967	1240.5063
482.0	416.6309	10.7998	0.00194	1579.4914	17.2727	1187.3418
483.0	414.1786	10.7875	0.00189	1618.7822	17.7336	1216.8776
484.0	411.6854	10.7536	0.00190	1595.2077	17.3875	1199.1561
485.0	409.6827	10.8254	0.00189	1603.0659	17.8052	1205.0633
486.0	407.4348	10.8280	0.00186	1610.9241	17.6927	1210.9705
487.0	404.6828	10.7708	0.00186	1595.2077	17.6765	1199.1561
488.0	401.9716	10.7192	0.00187	1587.3496	17.8879	1193.2489
489.0	400.0643	10.7689	0.00194	1524.4842	17.1034	1145.9916
490.0	397.7483	10.7742	0.00204	1453.7607	16.4020	1092.8270
491.0	395.4594	10.7885	0.00205	1430.1862	16.3502	1075.1055
492.0	393.5249	10.8492	0.00208	1406.6117	16.0633	1057.3840
493.0	391.6856	10.9122	0.00211	1383.0372	15.8868	1039.6625
494.0	389.5603	10.9188	0.00206	1398.7536	16.2698	1051.4768
495.0	387.5576	10.9359	0.00202	1422.3281	16.4420	1069.1983
496.0	385.7456	10.9812	0.00197	1438.0444	16.8029	1081.0127
497.0	382.5032	10.8769	0.00181	1563.7751	18.6831	1175.5274
498.0	380.4596	10.9345	0.00185	1508.7679	18.0487	1134.1772
499.0	378.0345	10.9153	0.00178	1555.9169	18.8380	1169.6203

APPENDIX F

1200 F First Text File for Fortran Program

1200FRun3_Celsius_Copy

0.00	24.31	24.27	24.31	23.97	23.57	23.98	24.16	24.28
1.00	24.33	24.28	24.34	23.97	23.52	24.00	24.20	24.30
2.00	24.60	24.40	24.36	24.03	23.55	24.03	24.23	28.56
3.00	26.88	25.94	24.39	25.09	23.58	24.69	25.28	57.24
4.00	31.21	29.61	24.78	28.24	23.52	26.77	28.44	89.68
5.00	36.87	34.80	25.97	33.07	23.57	29.96	32.94	115.40
6.00	43.36	40.97	28.24	38.97	23.60	33.79	38.29	135.16
7.00	50.37	47.75	31.29	45.58	23.64	38.07	44.16	150.69
8.00	57.72	54.94	34.66	52.65	23.69	42.51	50.46	163.28
9.00	65.12	62.24	38.14	59.87	23.70	47.33	56.98	173.61
10.00	72.54	69.60	41.32	67.18	23.71	51.72	63.63	182.51
11.00	79.99	77.00	44.26	74.54	23.73	56.03	70.42	190.44
12.00	87.34	84.31	47.11	81.82	23.74	59.72	77.16	197.57
13.00	94.59	91.54	49.66	89.04	23.73	63.63	83.87	204.12
14.00	101.82	98.76	52.07	96.24	23.73	67.25	90.68	210.36
15.00	108.88	105.83	54.04	103.31	23.71	70.47	97.41	216.34
16.00	115.86	112.81	56.04	110.28	23.70	75.24	104.08	222.18
17.00	122.81	119.76	57.91	117.22	23.71	77.74	110.79	227.95
18.00	129.59	126.56	59.41	124.03	23.68	80.85	117.38	233.58
19.00	136.30	133.28	61.08	130.76	23.70	84.73	123.97	239.12
20.00	142.97	139.96	62.86	137.44	23.74	87.88	130.58	244.62
21.00	149.51	146.51	64.47	144.00	23.74	92.37	137.02	249.97
22.00	155.93	152.97	65.62	150.47	23.77	96.35	143.42	255.30
23.00	162.30	159.37	67.06	156.87	23.76	99.49	149.77	260.59
24.00	168.59	165.65	68.55	163.15	23.74	102.66	156.03	265.83
25.00	174.82	171.88	70.34	169.38	23.70	106.62	162.20	271.08
26.00	181.07	178.13	71.37	175.62	23.70	109.78	168.38	276.35
27.00	187.22	184.26	72.64	181.75	23.69	112.12	174.46	281.55
28.00	193.33	190.35	73.52	187.84	23.72	115.87	180.53	286.71
29.00	199.41	196.43	74.68	193.92	23.71	118.67	186.57	291.88
30.00	205.41	202.41	75.61	199.90	23.73	122.53	192.52	297.02
31.00	211.33	208.33	77.09	205.82	23.72	126.02	198.43	302.14
32.00	217.27	214.24	78.01	211.73	23.72	129.32	204.36	307.29
33.00	223.09	220.06	79.27	217.54	23.69	133.33	210.11	312.39
34.00	228.84	225.81	81.08	223.30	23.68	136.82	215.86	317.44
35.00	234.61	231.55	83.06	229.03	23.66	141.55	221.62	322.51
36.00	240.27	237.19	83.66	234.68	23.72	144.47	227.23	327.51
37.00	245.83	242.78	84.22	240.28	23.74	147.78	232.81	332.47
38.00	251.44	248.34	85.62	245.82	23.78	151.63	238.38	337.42
39.00	256.94	253.80	86.72	251.30	23.79	155.55	243.93	342.29
40.00	262.35	259.19	87.86	256.67	23.77	158.76	249.28	347.14
41.00	267.69	264.56	88.81	262.06	23.80	163.33	254.60	351.97
42.00	273.00	269.82	90.18	267.33	23.86	164.99	259.93	356.69
43.00	278.19	275.03	91.39	272.53	23.87	168.35	265.08	361.39
44.00	283.42	280.21	92.67	277.71	23.82	172.68	270.32	366.09
45.00	288.51	285.28	93.54	282.81	23.84	177.39	275.38	370.71
46.00	293.54	290.29	94.58	287.79	23.85	180.59	280.36	375.28
47.00	298.54	295.28	96.00	292.79	23.89	185.05	285.37	379.83
48.00	303.48	300.17	96.85	297.66	23.91	187.46	290.29	384.31
49.00	308.34	305.00	98.11	302.51	23.85	190.46	295.13	388.73
50.00	313.12	309.80	99.03	307.31	23.86	194.98	299.83	393.16
51.00	317.87	314.52	100.11	312.05	23.90	198.94	304.57	397.53
52.00	322.58	319.17	101.37	316.69	23.92	201.48	309.29	401.85
53.00	327.22	323.79	102.51	321.32	23.98	205.52	313.94	406.13
54.00	331.74	328.32	103.77	325.85	23.96	207.81	318.34	410.35
55.00	336.26	332.79	104.69	330.32	23.97	211.26	322.87	414.52
56.00	340.72	337.23	106.14	334.77	23.93	215.17	327.29	418.66
57.00	345.09	341.59	106.92	339.12	23.96	219.14	331.64	422.71
58.00	349.39	345.87	108.00	343.42	23.99	222.18	335.93	426.72
59.00	353.66	350.12	108.77	347.67	23.96	226.63	340.18	430.70
60.00	357.86	354.28	109.97	351.83	24.05	228.95	344.35	434.63
61.00	361.98	358.37	111.00	355.93	24.08	231.58	348.48	438.51
62.00	366.09	362.45	112.01	360.01	24.12	234.61	352.53	442.36

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63.00	370.11	366.43	113.04	363.98	24.07	236.94	356.52	446.12
64.00	374.09	370.37	113.42	367.94	24.07	239.15	360.56	449.88
65.00	378.02	374.29	114.91	371.87	24.07	243.00	364.42	453.62
66.00	381.83	378.12	115.72	375.67	24.08	246.78	368.06	457.28
67.00	385.64	381.90	116.75	379.46	24.14	251.17	371.88	460.91
68.00	389.46	385.66	117.71	383.18	24.12	254.72	375.63	464.48
69.00	393.16	389.36	118.67	386.91	24.12	257.20	379.29	468.02
70.00	396.84	392.99	119.71	390.53	24.20	261.62	382.98	471.49
71.00	400.52	396.57	120.27	394.11	24.18	262.92	386.70	474.92
72.00	404.04	400.11	121.24	397.64	24.23	265.82	390.12	478.33
73.00	407.60	403.58	122.38	401.11	24.21	268.14	393.72	481.67
74.00	411.06	407.01	123.47	404.53	24.23	270.75	397.12	484.96
75.00	414.37	410.41	124.08	407.94	24.27	274.84	400.35	488.22
76.00	417.76	413.74	124.87	411.28	24.27	275.93	403.85	491.40
77.00	421.14	417.02	125.33	414.53	24.27	279.29	407.13	494.54
78.00	424.33	420.28	126.97	417.78	24.21	280.09	410.27	497.67
79.00	427.53	423.47	127.44	421.01	24.27	282.34	413.57	500.72
80.00	430.75	426.60	128.46	424.13	24.24	286.27	416.78	503.71
81.00	433.92	429.72	129.06	427.23	24.28	290.91	419.92	506.71
82.00	436.99	432.76	129.80	430.26	24.30	294.32	422.91	509.63
83.00	439.96	435.75	130.46	433.24	24.26	296.55	425.80	512.53
84.00	442.92	438.72	131.43	436.24	24.28	297.83	428.79	515.38
85.00	445.80	441.62	132.31	439.13	24.30	298.74	431.69	518.18
86.00	448.76	444.46	132.89	441.94	24.37	301.99	434.61	520.92
87.00	451.51	447.28	134.08	444.78	24.35	305.86	437.27	523.62
88.00	454.34	450.04	134.72	447.52	24.38	307.47	440.08	526.29
89.00	457.10	452.77	134.92	450.28	24.38	306.69	442.99	528.94
90.00	459.83	455.47	135.74	452.98	24.45	310.04	445.73	531.58
91.00	462.54	458.09	136.69	455.55	24.44	311.44	448.29	534.17
92.00	465.08	460.71	136.98	458.18	24.44	315.59	450.79	536.71
93.00	467.73	463.28	137.95	460.73	24.43	317.99	453.47	539.21
94.00	470.27	465.79	139.06	463.25	24.45	319.06	456.03	541.65
95.00	472.67	468.28	139.52	465.74	24.46	322.20	458.37	544.04
96.00	475.22	470.73	140.08	468.21	24.52	321.19	461.06	546.45
97.00	477.68	473.13	141.21	470.60	24.47	327.26	463.49	548.83
98.00	479.98	475.49	142.07	472.97	24.48	328.56	465.73	551.12
99.00	482.32	477.82	142.37	475.25	24.48	331.81	467.93	553.39
100.00	484.59	480.09	143.07	477.53	24.49	333.91	470.18	555.62
101.00	486.97	482.33	142.65	479.74	24.55	332.17	472.66	557.81
102.00	489.18	484.57	143.98	481.99	24.52	335.57	474.87	559.96
103.00	491.39	486.74	144.37	484.16	24.61	339.00	477.04	562.04
104.00	493.49	488.89	144.49	486.31	24.59	340.35	479.12	564.10
105.00	495.72	491.03	144.18	488.44	24.63	338.88	481.50	566.18
106.00	497.87	493.10	145.69	490.47	24.59	344.07	483.56	568.25
107.00	499.88	495.15	146.56	492.53	24.61	345.53	485.50	570.27
108.00	501.90	497.18	147.56	494.57	24.60	349.71	487.46	572.24
109.00	504.01	499.17	147.59	496.53	24.62	350.45	489.61	574.17
110.00	505.93	501.12	148.21	498.53	24.67	353.27	491.59	576.06
111.00	507.84	503.04	149.11	500.42	24.67	353.02	493.44	577.95
112.00	509.64	504.94	149.98	502.33	24.68	354.88	495.24	579.79
113.00	511.58	506.78	150.42	504.13	24.72	359.69	497.10	581.61
114.00	513.51	508.62	150.67	505.98	24.72	362.23	499.09	583.42
115.00	515.33	510.42	151.30	507.81	24.78	361.09	500.99	585.17
116.00	517.03	512.20	150.18	509.62	24.78	358.49	502.79	586.88
117.00	518.73	513.95	151.72	511.33	24.82	364.69	504.32	588.64
118.00	520.59	515.68	152.72	513.09	24.73	365.41	506.29	590.34
119.00	522.35	517.36	153.27	514.73	24.71	366.31	508.06	592.00
120.00	524.01	519.03	153.42	516.38	24.76	368.16	509.60	593.64
121.00	525.53	520.67	153.87	518.06	24.76	370.04	511.14	595.24
122.00	527.24	522.27	154.41	519.63	24.87	372.63	512.86	596.84
123.00	528.84	523.87	155.14	521.25	24.91	374.14	514.48	598.40
124.00	530.37	525.43	155.68	522.81	24.84	375.64	516.03	599.95
125.00	531.89	526.96	156.10	524.33	24.90	375.89	517.48	601.49

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126.00	533.36	528.48	156.23	525.89	24.89	376.29	519.08	603.00
127.00	534.89	529.98	156.78	527.39	24.93	378.29	520.57	604.50
128.00	536.46	531.46	157.08	528.87	24.93	378.59	522.22	605.95
129.00	537.97	532.92	157.81	530.30	25.03	384.93	523.68	607.40
130.00	539.41	534.32	158.06	531.69	24.96	383.19	525.20	608.79
131.00	540.72	535.71	158.32	533.05	24.95	382.01	526.42	610.17
132.00	542.23	537.10	158.52	534.43	25.03	384.98	527.93	611.52
133.00	543.52	538.44	158.70	535.77	24.93	388.10	529.13	612.84
134.00	544.76	539.78	159.12	537.14	24.97	387.68	530.43	614.12
135.00	546.23	541.11	160.21	538.47	24.99	389.46	531.97	615.41
136.00	547.47	542.39	160.62	539.75	25.02	390.16	533.12	616.68
137.00	548.88	543.68	159.54	541.02	25.07	390.22	534.72	617.99
138.00	550.06	544.96	160.14	542.32	25.06	389.62	535.84	619.31
139.00	551.40	546.19	161.59	543.49	25.05	392.18	537.13	620.57
140.00	552.64	547.41	161.68	544.71	25.07	394.00	538.38	621.76
141.00	553.83	548.62	161.83	545.96	25.09	396.28	539.72	622.94
142.00	555.02	549.79	162.44	547.12	25.04	394.51	540.88	624.08
143.00	556.22	550.95	162.28	548.24	25.13	398.19	542.04	625.27
144.00	557.32	552.12	163.66	549.46	25.05	398.00	543.16	626.40
145.00	558.36	553.23	163.61	550.58	25.11	401.01	544.20	627.47
146.00	559.41	554.33	163.83	551.63	25.18	402.20	545.08	628.56
147.00	560.54	555.39	164.40	552.67	25.19	403.26	546.23	629.62
148.00	561.73	556.49	163.70	553.80	25.16	398.89	547.62	630.67
149.00	562.77	557.54	165.01	554.83	25.22	404.71	548.52	631.72
150.00	563.74	558.58	165.49	555.87	25.24	408.06	549.46	632.73
151.00	564.79	559.60	164.42	556.91	25.28	399.37	550.66	633.74
152.00	565.84	560.62	163.78	557.93	25.29	400.34	551.74	634.73
153.00	566.88	561.62	165.18	558.88	25.23	406.13	552.67	635.73
154.00	567.81	562.60	166.30	559.85	25.27	407.58	553.56	636.70
155.00	568.88	563.55	166.74	560.79	25.29	409.98	554.68	637.64
156.00	569.74	564.49	166.37	561.74	25.43	407.57	555.52	638.54
157.00	570.64	565.43	166.22	562.70	25.39	409.55	556.43	639.44
158.00	571.70	566.34	167.48	563.59	25.36	411.09	557.54	640.32
159.00	572.52	567.24	167.07	564.50	25.36	410.81	558.37	641.19
160.00	573.46	568.11	168.31	565.33	25.32	416.64	559.28	642.07
161.00	574.27	568.96	168.04	566.22	25.39	417.08	560.11	642.90
162.00	575.07	569.80	168.72	567.09	25.35	414.13	560.98	643.72
163.00	576.07	570.66	168.00	567.93	25.42	414.17	562.09	644.54
164.00	576.79	571.47	168.07	568.73	25.45	414.28	562.66	645.36
165.00	577.67	572.29	168.87	569.54	25.43	414.54	563.56	646.17
166.00	578.37	573.08	169.54	570.34	25.49	417.00	564.18	646.95
167.00	579.25	573.86	170.11	571.12	25.50	419.22	565.11	647.71
168.00	580.09	574.63	168.80	571.88	25.46	416.76	566.08	648.46
169.00	580.87	575.42	168.43	572.71	25.43	416.21	566.95	649.22
170.00	581.57	576.19	169.00	573.47	25.52	416.38	567.59	649.99
171.00	582.31	576.93	169.97	574.17	25.47	418.06	568.24	650.74
172.00	583.15	577.67	171.09	574.91	25.47	422.01	569.13	651.47
173.00	583.84	578.36	171.19	575.55	25.54	422.29	569.74	652.18
174.00	584.62	579.07	171.20	576.28	25.59	423.01	570.61	652.87
175.00	585.21	579.74	171.37	576.93	25.53	424.51	571.04	653.56
176.00	585.85	580.43	169.96	577.62	25.63	419.72	571.80	654.22
177.00	586.63	581.11	170.52	578.28	25.54	422.23	572.48	654.92
178.00	587.31	581.77	171.63	578.93	25.58	428.66	573.12	655.62
179.00	587.87	582.41	172.63	579.58	25.54	432.26	573.61	656.28
180.00	588.52	583.07	170.87	580.32	25.54	423.22	574.58	656.87
181.00	589.19	583.70	171.79	580.92	25.53	427.49	575.12	657.51
182.00	589.86	584.33	172.67	581.57	25.66	431.03	575.91	658.12
183.00	590.42	584.94	172.63	582.15	25.66	428.15	576.40	658.72
184.00	591.08	585.57	171.91	582.79	25.67	429.02	577.03	659.32
185.00	591.67	586.17	172.64	583.41	25.68	428.65	577.67	659.87
186.00	592.34	586.76	172.87	583.99	25.64	430.06	578.36	660.42
187.00	592.88	587.35	173.41	584.59	25.72	430.97	578.86	660.98
188.00	593.40	587.91	174.09	585.13	25.76	429.72	579.31	661.54

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189.00	594.03	588.47	174.13	585.68	25.76	433.38	580.01	662.09
190.00	594.54	588.99	175.07	586.20	25.69	435.82	580.52	662.63
191.00	594.91	589.52	174.69	586.77	25.74	434.54	580.84	663.15
192.00	595.59	590.03	175.14	587.28	25.71	434.71	581.66	663.66
193.00	596.03	590.54	175.42	587.79	25.69	437.44	582.13	664.16
194.00	596.52	591.04	175.38	588.34	25.77	436.06	582.68	664.64
195.00	597.03	591.55	175.41	588.83	25.78	439.92	583.22	665.16
196.00	597.56	592.06	174.22	589.36	25.83	435.79	583.76	665.67
197.00	598.08	592.57	175.77	589.87	25.89	438.28	584.26	666.16
198.00	598.53	593.03	176.31	590.28	25.82	441.99	584.65	666.64
199.00	598.93	593.53	176.28	590.84	25.84	438.85	585.19	667.12
200.00	599.51	593.98	176.62	591.23	25.87	439.99	585.70	667.61
201.00	599.83	594.46	176.75	591.77	25.91	439.96	586.17	668.04
202.00	600.45	594.92	175.45	592.22	25.92	437.33	586.86	668.51
203.00	600.86	595.36	176.71	592.62	25.93	442.90	587.05	668.98
204.00	601.22	595.80	176.50	593.10	25.95	440.44	587.47	669.42
205.00	601.78	596.26	177.07	593.59	25.93	441.12	588.19	669.88
206.00	602.19	596.68	176.78	594.03	26.12	440.83	588.57	670.31
207.00	602.59	597.11	176.92	594.42	26.23	441.98	588.88	670.72
208.00	603.04	597.54	177.52	594.90	26.37	440.48	589.38	671.11
209.00	603.60	597.96	177.17	595.25	26.42	441.97	589.86	671.53
210.00	603.94	598.39	177.56	595.66	26.48	441.76	590.12	671.93
211.00	604.49	598.83	177.42	596.08	26.51	438.53	590.77	672.36
212.00	604.86	599.24	177.52	596.41	26.53	440.63	590.89	672.78
213.00	605.26	599.66	178.03	596.77	26.48	441.15	591.20	673.20
214.00	605.74	600.08	177.71	597.18	26.54	440.04	591.79	673.61
215.00	606.11	600.47	178.61	597.52	26.58	443.42	592.07	673.99
216.00	606.69	600.85	178.56	597.85	26.53	444.37	592.68	674.39
217.00	606.93	601.21	178.58	598.17	26.42	449.61	592.76	674.77
218.00	607.36	601.56	178.28	598.55	26.44	449.77	593.29	675.14
219.00	607.55	601.90	178.06	598.96	26.47	450.13	593.47	675.46
220.00	608.03	602.23	178.76	599.31	26.54	448.33	594.09	675.78
221.00	608.31	602.57	178.77	599.68	26.56	448.24	594.37	676.07
222.00	608.58	602.91	178.92	600.02	26.72	444.54	594.59	676.38
223.00	608.97	603.27	178.96	600.33	26.74	444.03	594.94	676.76
224.00	609.36	603.62	179.20	600.64	26.73	446.68	595.33	677.15
225.00	609.67	603.94	179.34	600.96	26.70	448.57	595.62	677.51
226.00	610.07	604.28	179.76	601.36	26.68	450.71	596.16	677.82
227.00	610.48	604.60	180.09	601.67	26.69	447.74	596.64	678.15
228.00	610.73	604.92	180.18	601.99	26.71	452.33	596.82	678.44
229.00	611.11	605.19	179.83	602.25	26.79	451.94	597.19	678.72
230.00	611.28	605.49	180.29	602.54	26.84	452.23	597.30	679.02
231.00	611.59	605.79	180.07	602.91	26.91	448.88	597.72	679.28
232.00	611.92	606.11	180.16	603.21	26.95	449.54	598.04	679.54
233.00	612.22	606.40	179.94	603.46	26.86	452.29	598.27	679.83
234.00	612.50	606.70	179.38	603.79	26.87	455.19	598.63	680.12
235.00	612.78	606.97	180.56	604.00	26.96	447.93	598.86	680.41
236.00	613.04	607.26	180.72	604.26	26.89	451.26	599.03	680.68
237.00	613.37	607.53	180.56	604.56	26.91	455.97	599.43	680.94
238.00	613.58	607.77	180.72	604.87	26.94	455.14	599.73	681.17
239.00	613.75	608.02	180.31	605.16	26.93	455.59	599.88	681.41
240.00	614.08	608.27	180.83	605.42	26.96	456.33	600.31	681.65
241.00	614.31	608.53	181.77	605.71	27.07	450.43	600.56	681.91
242.00	614.60	608.80	181.41	605.97	27.05	453.86	600.84	682.18
243.00	614.90	609.04	181.64	606.18	27.06	451.69	601.06	682.47
244.00	615.08	609.28	181.92	606.45	26.95	455.92	601.30	682.73
245.00	615.32	609.50	182.11	606.70	27.03	455.28	601.57	682.95
246.00	615.57	609.74	181.74	606.96	27.14	453.93	601.91	683.17
247.00	615.79	609.96	181.61	607.16	27.08	455.49	602.07	683.45
248.00	616.00	610.18	181.68	607.40	27.12	457.39	602.31	683.69
249.00	616.22	610.42	181.46	607.67	27.24	453.53	602.67	683.94
250.00	616.49	610.67	181.63	607.87	27.19	456.15	602.79	684.20
251.00	616.70	610.92	182.09	608.14	27.28	458.43	603.03	684.42

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252.00	616.91	611.13	182.19	608.34	27.30	459.85	603.23	684.61
253.00	617.14	611.34	182.44	608.57	27.25	459.76	603.57	684.81
254.00	617.35	611.55	182.28	608.79	27.24	455.55	603.76	685.01
255.00	617.56	611.74	182.79	608.96	27.23	458.81	603.90	685.24
256.00	617.85	611.94	182.24	609.17	27.16	459.05	604.27	685.49
257.00	618.04	612.14	183.64	609.39	27.16	461.93	604.62	685.72
258.00	618.16	612.35	183.11	609.63	27.03	457.79	604.75	685.95
259.00	618.44	612.60	183.09	609.87	27.15	453.64	605.01	686.18
260.00	618.79	612.84	183.19	609.97	26.99	452.48	605.32	686.46
261.00	618.97	613.07	183.14	610.12	27.02	455.49	605.28	686.73
262.00	619.27	613.30	182.62	610.32	26.87	454.54	605.61	686.96
263.00	619.47	613.53	182.91	610.44	26.80	457.09	605.64	687.19
264.00	619.72	613.74	182.65	610.62	26.71	456.99	605.92	687.42
265.00	619.95	613.94	183.15	610.78	26.78	453.89	606.09	687.62
266.00	620.16	614.14	182.73	610.93	26.78	454.30	606.27	687.78
267.00	620.32	614.29	183.15	611.09	26.74	458.07	606.44	687.89
268.00	620.45	614.44	183.72	611.26	26.77	458.07	606.68	688.03
269.00	620.62	614.60	184.04	611.45	26.83	461.69	606.85	688.19
270.00	620.68	614.73	184.87	611.60	26.93	464.75	607.02	688.33
271.00	620.68	614.84	184.27	611.73	26.95	469.52	607.25	688.46
272.00	620.86	614.97	184.12	611.94	27.11	461.25	607.37	688.56
273.00	620.98	615.11	184.29	612.13	27.15	462.88	607.45	688.67
274.00	621.32	615.30	183.16	612.31	27.31	457.75	607.87	688.88
275.00	621.34	615.47	183.91	612.50	27.28	462.71	607.80	689.08
276.00	621.62	615.59	184.09	612.63	27.21	464.76	608.08	689.25
277.00	621.72	615.72	183.92	612.85	27.22	464.82	608.24	689.36
278.00	621.67	615.86	183.70	613.07	27.26	466.15	608.19	689.47
279.00	621.84	615.99	183.82	613.18	27.40	460.67	608.34	689.62
280.00	622.11	616.14	183.10	613.38	27.38	466.32	608.79	689.75
281.00	622.22	616.27	184.02	613.54	27.46	464.87	608.96	689.84
282.00	622.35	616.41	184.16	613.70	27.52	464.23	609.05	689.96
283.00	622.59	616.54	184.37	613.77	27.48	464.88	609.19	690.10
284.00	622.62	616.69	184.50	613.98	27.56	463.56	609.24	690.21
285.00	622.83	616.82	184.43	614.06	27.58	465.72	609.42	690.33
286.00	622.90	616.94	184.32	614.17	27.57	465.38	609.51	690.46
287.00	623.01	617.08	184.64	614.40	27.54	465.34	609.77	690.56
288.00	623.17	617.19	184.59	614.45	27.51	466.29	609.79	690.69
289.00	623.28	617.34	183.74	614.63	27.50	465.97	609.96	690.83
290.00	623.35	617.45	184.37	614.72	27.54	464.72	609.93	690.96
291.00	623.53	617.59	184.35	614.91	27.65	463.81	610.22	691.10
292.00	623.71	617.73	184.70	614.96	27.69	463.71	610.21	691.32
293.00	623.86	617.90	183.85	615.18	27.72	463.54	610.46	691.48
294.00	624.12	618.01	184.62	615.19	27.72	463.34	610.63	691.64
295.00	624.10	618.14	184.20	615.31	27.65	465.41	610.55	691.76
296.00	624.32	618.26	184.76	615.42	27.66	467.39	610.79	691.86
297.00	624.27	618.35	185.36	615.53	27.60	467.45	610.71	691.93
298.00	624.46	618.47	185.12	615.71	27.67	465.91	611.11	692.03
299.00	624.49	618.57	184.67	615.83	27.71	464.54	611.14	692.13
300.00	624.68	618.68	184.69	615.94	27.70	464.12	611.34	692.24
301.00	624.79	618.79	184.48	616.06	27.73	466.08	611.48	692.37
302.00	624.82	618.87	184.19	616.14	27.83	468.22	611.44	692.49
303.00	624.93	618.97	184.41	616.22	27.81	468.56	611.63	692.59
304.00	625.03	619.07	184.61	616.34	27.87	467.41	611.75	692.73
305.00	625.11	619.17	185.53	616.41	27.82	470.81	611.84	692.87
306.00	625.23	619.27	185.01	616.57	27.87	466.29	612.04	692.99
307.00	625.32	619.37	185.42	616.65	27.80	466.83	612.10	693.11
308.00	625.47	619.49	185.59	616.78	27.83	464.50	612.25	693.24
309.00	625.56	619.59	185.04	616.87	27.76	466.94	612.26	693.34
310.00	624.27	619.29	184.84	616.82	27.85	458.79	612.37	684.93
311.00	621.38	617.65	183.19	615.77	27.78	461.85	611.37	662.37
312.00	618.03	615.03	180.37	613.56	27.64	457.35	609.10	644.79
313.00	614.27	611.71	176.88	610.56	27.76	463.13	605.93	631.83
314.00	610.16	607.89	173.52	607.02	27.56	455.13	602.43	621.83

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315.00	606.03	603.90	170.41	603.14	27.28	451.52	598.77	613.94
316.00	601.82	599.76	167.47	599.07	27.52	452.43	594.87	607.43
317.00	597.62	595.56	164.62	594.88	27.57	442.03	591.06	601.75
318.00	593.39	591.37	163.21	590.68	27.32	437.66	586.96	596.69
319.00	589.16	587.16	161.48	586.44	26.81	440.89	583.09	592.03
320.00	584.82	582.86	159.51	582.13	26.69	439.09	579.04	587.53
321.00	580.65	578.66	157.12	577.88	26.99	429.17	575.14	583.28
322.00	576.55	574.54	155.57	573.68	26.91	428.77	571.19	579.20
323.00	572.41	570.46	155.09	569.61	26.75	424.80	567.33	575.20
324.00	568.37	566.37	154.28	565.51	26.77	422.84	563.56	571.21
325.00	564.28	562.32	153.19	561.55	26.97	420.99	559.74	567.23
326.00	560.30	558.31	152.26	557.62	26.98	413.87	555.96	563.29
327.00	556.28	554.34	150.36	553.69	27.26	407.37	551.98	559.42
328.00	552.46	550.54	148.71	549.90	27.29	397.48	548.28	555.68
329.00	548.67	546.75	147.45	546.03	27.31	401.18	544.46	551.99
330.00	544.91	542.96	147.01	542.17	27.36	397.74	540.79	548.28
331.00	541.13	539.21	145.18	538.47	27.26	393.39	537.11	544.57
332.00	537.40	535.51	143.88	534.69	27.37	391.10	533.35	540.91
333.00	533.74	531.83	143.26	530.97	27.36	385.60	529.76	537.24
334.00	530.09	528.21	142.31	527.31	27.19	379.52	526.17	533.63
335.00	526.44	524.61	141.23	523.70	27.26	380.14	522.43	530.07
336.00	522.86	520.98	139.82	520.04	27.18	376.37	518.99	526.48
337.00	519.32	517.43	138.85	516.47	27.25	368.41	515.38	522.97
338.00	515.81	513.93	137.50	512.97	27.17	363.65	512.02	519.47
339.00	512.32	510.44	136.44	509.42	27.11	365.51	508.37	515.99
340.00	508.86	506.97	136.22	505.97	27.16	358.97	504.99	512.54
341.00	505.39	503.54	134.73	502.53	27.11	358.70	501.51	509.13
342.00	501.96	500.09	133.45	499.07	27.08	358.77	498.08	505.73
343.00	498.56	496.70	133.01	495.69	27.16	355.01	494.71	502.33
344.00	495.15	493.33	132.45	492.35	27.32	352.64	491.35	498.96
345.00	491.73	489.94	131.37	489.05	27.33	348.51	488.01	495.57
346.00	488.46	486.62	130.12	485.72	27.38	346.36	484.84	492.24
347.00	485.06	483.32	129.60	482.48	27.33	341.82	481.37	488.92
348.00	481.80	480.04	128.27	479.23	27.33	339.71	478.19	485.61
349.00	478.58	476.83	127.45	476.03	27.30	337.41	474.98	482.37
350.00	475.35	473.63	127.00	472.84	27.41	332.75	471.73	479.13
351.00	472.14	470.43	126.09	469.67	27.41	329.34	468.61	475.89
352.00	468.96	467.26	125.32	466.54	27.46	328.47	465.43	472.72
353.00	465.81	464.12	123.94	463.44	27.51	326.00	462.31	469.56
354.00	462.66	460.98	123.20	460.32	27.44	323.18	459.19	466.41
355.00	459.56	457.89	122.51	457.27	27.61	320.86	456.21	463.31
356.00	456.46	454.82	121.68	454.24	27.33	315.13	453.05	460.21
357.00	453.46	451.81	119.79	451.22	27.28	309.41	450.12	457.15
358.00	450.47	448.82	118.52	448.23	27.23	310.96	447.10	454.16
359.00	447.53	445.85	118.41	445.26	27.36	309.49	444.07	451.18
360.00	444.54	442.87	118.03	442.30	27.30	304.11	441.19	448.19
361.00	441.60	439.97	117.48	439.41	27.28	303.99	438.26	445.26
362.00	438.72	437.09	116.36	436.51	27.29	301.78	435.41	442.35
363.00	435.83	434.22	116.12	433.62	27.43	301.11	432.52	439.44
364.00	432.98	431.38	114.81	430.79	27.43	295.89	429.68	436.57
365.00	430.19	428.57	113.68	427.93	27.37	294.01	426.83	433.75
366.00	427.32	425.77	113.33	425.13	27.33	289.99	424.02	430.91
367.00	424.57	423.02	112.46	422.37	27.29	287.18	421.24	428.12
368.00	421.85	420.30	111.06	419.61	27.23	285.17	418.54	425.37
369.00	419.13	417.58	110.35	416.83	27.18	282.27	415.83	422.63
370.00	416.44	414.91	110.18	414.11	27.25	281.23	413.11	419.93
371.00	413.74	412.23	109.10	411.43	27.34	279.17	410.47	417.21
372.00	411.02	409.53	108.48	408.76	27.27	277.06	407.79	414.51
373.00	408.37	406.88	107.54	406.14	27.32	273.94	405.20	411.84
374.00	405.72	404.25	107.26	403.58	27.28	272.42	402.59	409.18
375.00	403.02	401.58	105.95	401.02	27.36	270.96	400.02	406.48
376.00	400.40	398.97	104.97	398.48	27.41	268.62	397.40	403.84
377.00	397.81	396.39	104.22	395.97	27.32	265.79	394.92	401.26

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378.00	395.28	393.86	103.92	393.44	27.43	264.24	392.39	398.69
379.00	392.74	391.36	103.02	390.98	27.37	264.06	389.86	396.14
380.00	390.28	388.87	102.73	388.51	27.34	259.08	387.48	393.64
381.00	387.81	386.41	102.04	386.04	27.34	254.81	384.97	391.17
382.00	385.43	384.01	101.48	383.63	27.39	254.15	382.65	388.76
383.00	383.01	381.63	100.42	381.23	27.33	251.66	380.14	386.35
384.00	380.62	379.24	99.62	378.86	27.37	250.56	377.82	383.96
385.00	378.27	376.88	99.31	376.45	27.38	248.74	375.44	381.59
386.00	375.90	374.51	98.80	374.11	27.23	245.74	373.16	379.23
387.00	373.52	372.16	98.56	371.79	27.08	246.06	370.77	376.86
388.00	371.19	369.83	98.28	369.52	27.14	243.56	368.51	374.53
389.00	368.95	367.56	97.43	367.22	27.23	239.18	366.34	372.26
390.00	366.71	365.33	96.66	364.94	27.18	235.14	364.14	369.98
391.00	364.49	363.13	96.08	362.68	27.28	238.53	361.83	367.75
392.00	362.29	360.92	95.63	360.44	27.26	233.53	359.72	365.52
393.00	360.07	358.72	94.48	358.22	27.27	234.64	357.43	363.30
394.00	357.86	356.51	94.24	356.05	27.27	232.70	355.26	361.06
395.00	355.62	354.28	94.06	353.90	27.27	232.16	353.07	358.82
396.00	353.37	352.06	93.03	351.76	27.29	229.54	350.87	356.57
397.00	351.16	349.89	92.73	349.67	27.36	228.70	348.76	354.37
398.00	349.02	347.76	92.04	347.59	27.30	225.68	346.65	352.21
399.00	346.87	345.64	92.02	345.50	27.24	224.92	344.54	350.07
400.00	344.79	343.56	91.28	343.42	27.21	220.85	342.44	347.98
401.00	342.79	341.56	90.43	341.34	27.11	218.12	340.49	345.97
402.00	340.82	339.57	89.93	339.27	27.08	219.26	338.44	343.97
403.00	338.83	337.57	89.23	337.19	27.12	216.08	336.46	341.94
404.00	336.84	335.61	88.48	335.16	27.18	215.25	334.44	339.96
405.00	334.86	333.62	88.46	333.14	27.16	215.74	332.47	337.97
406.00	332.85	331.63	87.86	331.16	27.21	213.61	330.52	335.94
407.00	330.86	329.66	87.51	329.20	27.19	210.71	328.49	333.93
408.00	328.82	327.64	87.28	327.24	27.26	210.18	326.58	331.89
409.00	326.82	325.65	86.51	325.32	27.26	209.08	324.63	329.87
410.00	324.84	323.68	86.27	323.40	27.27	208.46	322.69	327.88
411.00	322.84	321.74	85.69	321.53	27.30	206.33	320.76	325.91
412.00	320.93	319.83	85.13	319.66	27.33	204.83	318.93	323.96
413.00	319.00	317.91	84.67	317.82	27.32	203.67	317.04	322.03
414.00	317.08	316.02	84.27	315.98	27.35	202.04	315.21	320.13
415.00	315.21	314.15	83.99	314.14	27.43	201.32	313.37	318.24
416.00	313.35	312.31	83.39	312.33	27.41	200.22	311.51	316.38
417.00	311.51	310.48	83.31	310.55	27.39	199.25	309.71	314.53
418.00	309.68	308.67	82.41	308.76	27.39	196.87	307.92	312.69
419.00	307.96	306.93	82.03	306.98	27.41	195.10	306.21	310.93
420.00	306.19	305.18	81.64	305.20	27.36	193.47	304.46	309.17
421.00	304.44	303.43	80.91	303.44	27.33	192.38	302.68	307.40
422.00	302.70	301.71	80.65	301.70	27.41	190.70	300.94	305.66
423.00	300.98	299.98	80.61	299.98	27.31	187.57	299.28	303.90
424.00	299.32	298.31	79.98	298.25	27.32	187.88	297.56	302.21
425.00	297.63	296.61	79.89	296.54	27.38	188.73	295.86	300.49
426.00	295.92	294.91	79.48	294.86	27.34	187.01	294.18	298.77
427.00	294.21	293.21	78.97	293.19	27.30	184.94	292.50	297.04
428.00	292.53	291.54	78.57	291.54	27.24	183.88	290.86	295.35
429.00	290.86	289.88	78.16	289.90	27.32	182.20	289.27	293.68
430.00	289.17	288.21	77.96	288.27	27.37	181.79	287.57	291.99
431.00	287.53	286.58	77.27	286.66	27.39	180.34	285.99	290.34
432.00	285.93	284.99	77.27	285.07	27.38	180.11	284.41	288.73
433.00	284.33	283.41	76.83	283.48	27.32	178.04	282.83	287.11
434.00	282.73	281.82	76.72	281.89	27.28	177.51	281.26	285.49
435.00	281.15	280.24	76.17	280.32	27.34	176.70	279.67	283.89
436.00	279.55	278.68	75.77	278.79	27.36	175.28	278.09	282.32
437.00	278.03	277.14	75.36	277.24	27.26	174.01	276.58	280.76
438.00	276.51	275.63	74.97	275.73	27.33	172.68	275.07	279.22
439.00	275.02	274.13	74.56	274.17	27.36	170.70	273.56	277.69
440.00	273.48	272.62	74.64	272.64	27.23	170.92	272.04	276.14

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441.00	271.99	271.12	73.81	271.16	27.27	168.69	270.58	274.64
442.00	270.51	269.63	73.40	269.64	27.22	168.15	269.10	273.13
443.00	269.06	268.19	73.08	268.16	27.13	166.30	267.58	271.67
444.00	267.64	266.76	72.64	266.69	27.09	166.18	266.18	270.23
445.00	266.23	265.33	72.41	265.22	27.12	165.38	264.82	268.78
446.00	264.79	263.92	72.26	263.77	27.11	165.12	263.33	267.33
447.00	263.39	262.51	71.94	262.33	27.09	163.15	261.92	265.91
448.00	261.99	261.09	71.70	260.87	27.17	162.14	260.54	264.47
449.00	260.56	259.68	71.24	259.44	27.12	161.96	259.06	263.04
450.00	259.16	258.28	70.77	258.04	27.07	161.29	257.72	261.61
451.00	257.75	256.88	70.56	256.63	27.09	159.84	256.31	260.20
452.00	256.34	255.48	70.37	255.26	27.14	158.69	254.90	258.78
453.00	254.97	254.11	70.00	253.90	27.15	158.32	253.59	257.40
454.00	253.58	252.73	69.66	252.54	27.08	157.01	252.18	255.99
455.00	252.20	251.36	69.31	251.19	27.08	156.92	250.87	254.60
456.00	250.83	249.99	69.06	249.87	27.00	154.67	249.51	253.23
457.00	249.48	248.64	68.58	248.54	27.02	153.49	248.16	251.86
458.00	248.14	247.31	68.39	247.23	27.07	152.10	246.88	250.51
459.00	246.83	246.01	68.39	245.93	26.93	151.36	245.55	249.18
460.00	245.52	244.70	68.12	244.63	26.96	150.58	244.23	247.86
461.00	244.27	243.44	67.84	243.34	27.05	150.00	243.01	246.60
462.00	243.00	242.19	67.37	242.06	27.08	148.77	241.73	245.32
463.00	241.73	240.91	67.36	240.77	27.02	148.71	240.45	244.01
464.00	240.44	239.64	66.91	239.52	26.94	146.61	239.13	242.72
465.00	239.16	238.36	66.72	238.26	26.87	147.18	237.87	241.43
466.00	237.91	237.10	66.46	237.02	26.88	145.51	236.66	240.17
467.00	236.68	235.87	66.01	235.77	26.91	145.48	235.46	238.93
468.00	235.42	234.62	66.14	234.55	26.87	144.42	234.25	237.67
469.00	234.21	233.39	65.61	233.32	26.59	143.76	233.03	236.43
470.00	233.00	232.21	65.36	232.11	26.62	142.92	231.82	235.24
471.00	231.82	231.02	65.14	230.92	26.81	143.36	230.66	234.04
472.00	230.59	229.80	64.94	229.72	26.81	141.63	229.46	232.81
473.00	229.35	228.59	64.65	228.57	26.82	140.88	228.24	231.59
474.00	228.19	227.41	64.36	227.38	26.83	139.87	227.10	230.41
475.00	227.02	226.26	63.99	226.21	26.79	138.54	225.94	229.24
476.00	225.87	225.12	64.11	225.04	26.82	138.42	224.79	228.09
477.00	224.76	224.02	63.80	223.87	26.81	136.64	223.65	226.96
478.00	223.61	222.88	63.43	222.72	26.82	136.51	222.51	225.79
479.00	222.48	221.74	63.23	221.60	26.64	135.81	221.43	224.63
480.00	221.37	220.62	63.10	220.49	26.73	133.54	220.30	223.50
481.00	220.25	219.50	62.76	219.37	26.74	133.91	219.14	222.36
482.00	219.14	218.38	62.64	218.26	26.80	134.74	218.04	221.24
483.00	218.01	217.27	62.47	217.16	26.74	132.49	216.93	220.11
484.00	216.91	216.17	62.07	216.07	26.68	130.27	215.82	218.98
485.00	215.86	215.10	61.83	214.98	26.77	130.13	214.82	217.89
486.00	214.76	214.02	61.51	213.89	26.78	131.08	213.72	216.79
487.00	213.64	212.92	61.29	212.83	26.73	129.59	212.58	215.67
488.00	212.60	211.87	61.06	211.78	26.73	129.21	211.56	214.61
489.00	211.58	210.84	60.84	210.73	26.77	128.61	210.53	213.55
490.00	210.48	209.77	60.81	209.67	26.74	128.42	209.43	212.47
491.00	209.42	208.71	60.62	208.62	26.71	128.27	208.43	211.37
492.00	208.38	207.65	60.24	207.62	26.76	127.09	207.42	210.32
493.00	207.32	206.61	59.85	206.61	26.76	126.22	206.42	209.26
494.00	206.26	205.57	59.75	205.58	26.78	126.16	205.32	208.20
495.00	205.24	204.56	59.62	204.59	26.74	125.48	204.38	207.16
496.00	204.24	203.55	59.38	203.59	26.76	123.31	203.37	206.14
497.00	203.22	202.53	59.22	202.61	26.78	123.39	202.37	205.12
498.00	202.22	201.52	58.82	201.63	26.79	123.06	201.38	204.11
499.00	201.23	200.55	58.68	200.66	26.78	122.42	200.41	203.12

APPENDIX G

1200 F Second Text File for Fortran Program

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0.0	-0.0681	-0.0915	-.00014	204.3123	1149.2567	153.5865
1.0	-0.0954	-0.1168	-.00020	180.7378	903.6891	135.8650
2.0	10.3133	12.8027	0.01016	518.6390	2593.1947	389.8734
3.0	80.5442	98.6255	0.01784	2263.1519	3843.0879	1701.2658
4.0	159.1402	126.1904	0.01988	3913.3668	2348.0199	2941.7722
5.0	219.3167	91.3820	0.01880	5555.7235	1858.7922	4176.3713
6.0	262.2046	56.5231	0.01702	7174.5057	1596.3053	5393.2490
7.0	292.8037	38.2750	0.01518	8793.2879	1444.1531	6610.1266
8.0	315.4193	28.7762	0.01367	10270.6232	1292.8057	7720.6751
9.0	332.2175	23.0085	0.01253	11520.0716	1194.4774	8659.9156
10.0	346.2501	19.6671	0.01161	12604.4985	1057.7201	9475.1055
11.0	358.4843	17.4587	0.01085	13547.4785	941.5236	10183.9663
12.0	368.9747	15.7944	0.01018	14404.0186	826.2343	10827.8481
13.0	378.7702	14.6087	0.00961	15158.4025	748.9740	11394.9367
14.0	388.1571	13.6943	0.00916	15755.6232	672.5189	11843.8819
15.0	397.9935	13.1207	0.00880	16234.9713	602.6592	12204.2194
16.0	407.4076	12.5959	0.00849	16659.3123	577.5570	12523.2068
17.0	416.9851	12.1906	0.00823	16997.2134	514.3743	12777.2152
18.0	427.1213	11.9567	0.00801	17272.2492	472.8524	12983.9663
19.0	436.6035	11.6791	0.00784	17445.1289	444.5877	13113.9241
20.0	445.7314	11.3965	0.00771	17531.5687	410.5754	13178.9030
21.0	454.9139	11.1711	0.00757	17657.2994	395.4110	13273.4178
22.0	465.1454	11.1146	0.00747	17696.5902	375.9899	13302.9536
23.0	474.5868	10.9590	0.00738	17720.1647	352.4452	13320.6751
24.0	483.7965	10.7964	0.00728	17767.3137	332.8597	13356.1182
25.0	492.2841	10.5552	0.00718	17845.8954	321.0656	13415.1899
26.0	502.6791	10.5457	0.00706	17948.0515	306.2517	13491.9832
27.0	512.2976	10.4645	0.00695	18050.2077	289.5497	13568.7764
28.0	522.8016	10.4969	0.00686	18105.2148	280.0016	13610.1266
29.0	532.6516	10.4510	0.00677	18168.0802	267.5711	13657.3840
30.0	542.9648	10.4662	0.00669	18223.0873	260.3505	13698.7342
31.0	551.9021	10.3417	0.00662	18246.6618	251.9870	13716.4557
32.0	562.2562	10.3557	0.00656	18262.3782	243.3722	13728.2701
33.0	571.6975	10.2875	0.00647	18364.5343	239.1907	13805.0633
34.0	579.6402	10.0983	0.00642	18372.3925	232.4638	13810.9705
35.0	587.1879	9.8844	0.00636	18380.2507	229.5618	13816.8777
36.0	597.9779	9.9755	0.00629	18443.1160	222.8476	13864.1351
37.0	608.7817	10.0662	0.00625	18427.3997	216.7363	13852.3207
38.0	617.4737	9.9843	0.00619	18482.4068	213.0673	13893.6709
39.0	626.7379	9.9596	0.00617	18411.6833	208.3293	13840.5064
40.0	635.8386	9.9221	0.00610	18490.2650	204.2747	13899.5781
41.0	645.3481	9.9267	0.00605	18521.6977	202.9281	13923.2068
42.0	653.5769	9.8554	0.00602	18490.2650	194.7710	13899.5781
43.0	662.1190	9.8051	0.00597	18553.1303	191.8077	13946.8355
44.0	670.5113	9.7387	0.00594	18529.5558	189.7764	13929.1140
45.0	679.6938	9.7517	0.00589	18560.9885	189.4086	13952.7427
46.0	688.3586	9.7325	0.00583	18647.4283	186.9104	14017.7216
47.0	696.0424	9.6531	0.00580	18631.7120	185.7290	14005.9072
48.0	704.9388	9.6648	0.00576	18663.1446	181.4990	14029.5359
49.0	712.7044	9.5980	0.00572	18694.5773	178.6011	14053.1646
50.0	721.2874	9.5958	0.00566	18796.7335	179.2821	14129.9578
51.0	729.3663	9.5703	0.00563	18812.4498	178.0920	14141.7722
52.0	736.8595	9.5133	0.00561	18788.8753	174.2759	14124.0507
53.0	744.5706	9.4816	0.00559	18788.8753	173.2936	14124.0507
54.0	751.8321	9.4201	0.00552	18946.0386	171.3970	14242.1941
55.0	759.7884	9.4130	0.00550	18938.1805	169.6801	14236.2870
56.0	773.9300	9.4133	0.00546	18993.1876	169.3972	14277.6372
57.0	789.7461	9.5195	0.00543	19024.6203	169.0994	14301.2659
58.0	805.2297	9.5848	0.00540	19032.4785	167.3103	14307.1730
59.0	821.0595	9.6810	0.00537	19071.7693	167.9592	14336.7089
60.0	836.4080	9.7345	0.00534	19111.0601	165.6071	14366.2448
61.0	851.8488	9.8008	0.00533	19103.2019	163.4149	14360.3376
62.0	867.3327	9.8685	0.00529	19173.9254	162.5904	14413.5022

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63.0	882.5627	9.9189	0.00526	19221.0744	160.7337	14448.9452
64.0	898.5283	10.0569	0.00526	19150.3509	157.7387	14395.7806
65.0	913.4870	10.0561	0.00523	19236.7908	158.4362	14460.7595
66.0	928.8732	10.1362	0.00515	19472.5358	160.5541	14637.9747
67.0	943.9899	10.1931	0.00514	19464.6776	161.2575	14632.0676
68.0	959.1010	10.2474	0.00510	19566.8338	161.8282	14708.8608
69.0	974.1297	10.3022	0.00508	19606.1246	160.5816	14738.3967
70.0	988.9395	10.3542	0.00506	19613.9828	161.6167	14744.3038
71.0	1004.1292	10.4500	0.00506	19543.2593	157.8828	14691.1393
72.0	1018.9302	10.5038	0.00502	19700.4226	158.4909	14809.2827
73.0	1033.3114	10.5249	0.00502	19637.5572	156.3776	14762.0254
74.0	1047.6155	10.5559	0.00499	19716.1389	156.0232	14821.0971
75.0	1062.4089	10.6442	0.00495	19834.0114	158.0259	14909.7047
76.0	1076.7073	10.7034	0.00498	19676.8481	153.8255	14791.5612
77.0	1091.3000	10.7990	0.00493	19818.2951	155.0256	14897.8903
78.0	1104.6078	10.7499	0.00490	19896.8767	152.8504	14956.9621
79.0	1118.8893	10.8449	0.00493	19747.5716	150.4832	14844.7258
80.0	1132.3985	10.8652	0.00491	19763.2879	151.4364	14856.5401
81.0	1146.4666	10.9419	0.00489	19802.5787	153.4951	14886.0760
82.0	1160.1044	10.9962	0.00485	19928.3094	154.9769	14980.5908
83.0	1173.8009	11.0522	0.00482	20022.6074	154.9138	15051.4768
84.0	1186.9951	11.0773	0.00482	19983.3166	152.5897	15021.9410
85.0	1200.0696	11.1112	0.00482	19959.7421	150.1297	15004.2195
86.0	1213.2997	11.1802	0.00479	20022.6074	150.9811	15051.4768
87.0	1225.6323	11.1698	0.00476	20132.6217	153.2033	15134.1773
88.0	1238.5939	11.2259	0.00474	20171.9125	152.1133	15163.7131
89.0	1251.9688	11.3260	0.00479	19951.8839	146.3762	14998.3123
90.0	1264.6470	11.3631	0.00478	19951.8839	147.0414	14998.3123
91.0	1277.0090	11.3770	0.00473	20156.1962	147.2868	15151.8988
92.0	1289.9355	11.4627	0.00471	20211.2034	149.4973	15193.2490
93.0	1301.8886	11.4681	0.00471	20171.9125	148.8885	15163.7131
94.0	1313.4007	11.4596	0.00471	20140.4799	147.0406	15140.0844
95.0	1325.5080	11.5206	0.00469	20234.7779	148.6030	15210.9705
96.0	1337.6513	11.5747	0.00473	20030.4656	143.2111	15057.3840
97.0	1348.9985	11.5557	0.00471	20077.6146	147.3827	15092.8270
98.0	1360.1887	11.5668	0.00469	20156.1962	146.9408	15151.8988
99.0	1372.1061	11.6384	0.00465	20352.6504	149.5175	15299.5781
100.0	1383.3017	11.6663	0.00464	20384.0830	149.5835	15323.2068
101.0	1395.7166	11.8181	0.00465	20242.6360	144.0871	15216.8777
102.0	1405.7731	11.7682	0.00465	20242.6360	145.3168	15216.8777
103.0	1416.7042	11.8294	0.00463	20297.6432	147.0429	15258.2279
104.0	1427.8988	11.9091	0.00462	20329.0759	146.4924	15281.8566
105.0	1439.8096	12.0436	0.00466	20109.0472	141.0007	15116.4557
106.0	1449.3329	11.9681	0.00463	20242.6360	145.1201	15216.8777
107.0	1459.4354	11.9675	0.00460	20336.9340	145.2926	15287.7638
108.0	1469.1779	11.9489	0.00458	20423.3739	148.2581	15352.7427
109.0	1479.9412	12.0342	0.00458	20360.5085	146.3089	15305.4853
110.0	1489.7586	12.0585	0.00460	20281.9269	146.6281	15246.4135
111.0	1499.2378	12.0480	0.00458	20368.3667	145.0509	15311.3924
112.0	1508.4910	12.0396	0.00458	20376.2249	145.1700	15317.2996
113.0	1518.2290	12.0782	0.00455	20486.2392	149.0872	15400.0000
114.0	1528.2217	12.1341	0.00456	20384.0830	148.9399	15323.2068
115.0	1537.3774	12.1510	0.00458	20281.9269	144.9745	15246.4135
116.0	1548.7379	12.3504	0.00461	20140.4799	139.5790	15140.0844
117.0	1556.8015	12.2685	0.00456	20391.9412	146.0508	15329.1140
118.0	1565.2119	12.2287	0.00459	20226.9197	143.5665	15205.0633
119.0	1574.0759	12.2438	0.00458	20219.0615	142.6389	15199.1562
120.0	1583.4196	12.3064	0.00454	20384.0830	144.1137	15323.2068
121.0	1592.1168	12.3308	0.00455	20360.5085	144.3041	15305.4853
122.0	1600.6898	12.3574	0.00455	20344.7922	145.0781	15293.6709
123.0	1608.8112	12.3533	0.00456	20305.5014	144.6890	15264.1351
124.0	1617.1511	12.3593	0.00456	20281.9269	144.4639	15246.4135
125.0	1625.6592	12.3907	0.00454	20376.2249	143.9055	15317.2996

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126.0	1634.3663	12.4439	0.00459	20195.4870	141.4360	15181.4346
127.0	1642.4602	12.4570	0.00457	20258.3524	142.3859	15228.6920
128.0	1650.6386	12.4901	0.00459	20132.6217	140.1668	15134.1773
129.0	1658.2298	12.4882	0.00457	20211.2034	145.6663	15193.2490
130.0	1666.1870	12.5178	0.00459	20093.3309	141.4968	15104.6414
131.0	1674.0224	12.5520	0.00457	20226.9197	140.0648	15205.0633
132.0	1681.8223	12.5995	0.00455	20234.7779	141.5569	15210.9705
133.0	1689.4970	12.6302	0.00453	20344.7922	144.2552	15293.6709
134.0	1696.6123	12.6471	0.00455	20258.3524	141.9094	15228.6920
135.0	1702.8219	12.5938	0.00456	20171.9125	141.5462	15163.7131
136.0	1709.8713	12.6092	0.00454	20289.7850	141.9197	15252.3207
137.0	1719.3750	12.7861	0.00459	20022.6074	138.5594	15051.4768
138.0	1726.5327	12.7818	0.00458	20116.9054	137.5776	15122.3629
139.0	1732.0530	12.6849	0.00456	20179.7707	139.2135	15169.6203
140.0	1739.1674	12.7308	0.00456	20171.9125	139.7108	15163.7131
141.0	1746.1726	12.7696	0.00461	19959.7421	139.1569	15004.2195
142.0	1752.2775	12.7526	0.00460	19991.1747	136.5725	15027.8481
143.0	1759.7663	12.8304	0.00458	20061.8982	139.4694	15081.0127
144.0	1764.7026	12.7318	0.00459	20030.4656	137.9878	15057.3840
145.0	1771.3724	12.7897	0.00459	20022.6074	139.8335	15051.4768
146.0	1777.7191	12.8216	0.00454	20258.3524	141.7825	15228.6920
147.0	1783.4194	12.8114	0.00454	20242.6360	141.5844	15216.8777
148.0	1790.9519	12.9269	0.00460	19951.8839	134.1503	14998.3123
149.0	1795.5133	12.8445	0.00455	20164.0544	140.2175	15157.8059
150.0	1801.0980	12.8421	0.00454	20211.2034	142.9420	15193.2490
151.0	1808.9496	13.0016	0.00459	19991.1747	132.1439	15027.8481
152.0	1816.0545	13.1139	0.00459	19944.0257	131.7307	14992.4051
153.0	1820.2393	13.0064	0.00456	20101.1891	137.1783	15110.5486
154.0	1824.5906	12.9373	0.00455	20156.1962	138.0771	15151.8988
155.0	1829.8267	12.9362	0.00456	20077.6146	138.7480	15092.8270
156.0	1836.0349	13.0277	0.00455	20116.9054	135.9761	15122.3629
157.0	1841.9068	13.0797	0.00455	20101.1891	136.8514	15110.5486
158.0	1845.4778	12.9857	0.00456	20030.4656	136.7734	15057.3840
159.0	1851.5886	13.0659	0.00456	20022.6074	135.6903	15051.4768
160.0	1855.2597	12.9749	0.00455	20054.0401	140.5876	15075.1055
161.0	1860.8971	13.0452	0.00456	20038.3237	140.1064	15063.2912
162.0	1865.0547	13.0090	0.00458	19928.3094	135.7052	14980.5908
163.0	1871.3153	13.1249	0.00461	19771.1461	133.6641	14862.4473
164.0	1876.3857	13.1568	0.00456	19991.1747	134.7316	15027.8481
165.0	1880.3056	13.1093	0.00457	19959.7421	133.9430	15004.2195
166.0	1884.2460	13.0805	0.00455	20069.7564	136.3589	15086.9199
167.0	1888.1661	13.0569	0.00455	20006.8911	137.1379	15039.6625
168.0	1894.9934	13.2204	0.00459	19826.1532	132.7743	14903.7975
169.0	1900.4049	13.2890	0.00462	19692.5644	130.6402	14803.3756
170.0	1904.4636	13.2736	0.00460	19771.1461	130.7471	14862.4473
171.0	1907.7219	13.2017	0.00458	19889.0186	132.4316	14951.0549
172.0	1910.6718	13.1202	0.00458	19834.0114	134.8132	14909.7047
173.0	1915.0421	13.1487	0.00456	19951.8839	135.3129	14998.3123
174.0	1919.4758	13.1822	0.00458	19818.2951	134.2703	14897.8903
175.0	1923.6277	13.1896	0.00454	20030.4656	136.6904	15057.3840
176.0	1930.0638	13.3723	0.00458	19873.3022	130.6785	14939.2405
177.0	1933.7053	13.3385	0.00454	20022.6074	133.2669	15051.4768
178.0	1936.4382	13.2582	0.00453	20069.7564	138.9284	15086.9199
179.0	1939.1406	13.1840	0.00451	20171.9125	142.7034	15163.7131
180.0	1945.7182	13.3880	0.00461	19716.1389	130.2637	14821.0971
181.0	1948.4147	13.3215	0.00457	19896.8767	134.7722	14956.9621
182.0	1950.9796	13.2705	0.00460	19731.8552	136.1966	14832.9114
183.0	1954.8949	13.3016	0.00458	19826.1532	133.7346	14903.7975
184.0	1959.9481	13.4024	0.00457	19873.3022	134.2639	14939.2405
185.0	1962.3180	13.3526	0.00458	19794.7206	132.8307	14880.1688
186.0	1965.5360	13.3508	0.00458	19779.0042	133.3716	14868.3545
187.0	1968.3203	13.3275	0.00457	19841.8696	134.1724	14915.6119
188.0	1970.8933	13.2869	0.00455	19936.1676	133.2780	14986.4979

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189.0	1974.4357	13.3073	0.00456	19841.8696	135.3265	14915.6119
190.0	1976.4490	13.2307	0.00457	19834.0114	137.0699	14909.7047
191.0	1980.4168	13.2958	0.00456	19904.7349	136.0594	14962.8692
192.0	1983.0040	13.2707	0.00460	19700.4226	134.0621	14809.2827
193.0	1985.8495	13.2626	0.00461	19661.1317	135.8856	14779.7469
194.0	1989.0764	13.2955	0.00463	19574.6919	133.5043	14714.7680
195.0	1992.4080	13.3158	0.00464	19535.4011	136.3252	14685.2321
196.0	1997.5997	13.4614	0.00464	19519.6848	131.9195	14673.4178
197.0	1998.3264	13.3330	0.00463	19551.1174	133.9372	14697.0465
198.0	2000.6265	13.2942	0.00461	19637.5572	137.6518	14762.0254
199.0	2003.8480	13.3200	0.00467	19441.1031	132.8499	14614.3460
200.0	2006.4726	13.3104	0.00464	19527.5429	134.0155	14679.3249
201.0	2009.1019	13.3195	0.00470	19323.2306	132.1648	14525.7384
202.0	2014.2555	13.4708	0.00471	19228.9326	128.6025	14454.8524
203.0	2015.3792	13.3666	0.00464	19527.5429	135.4668	14679.3249
204.0	2018.5973	13.4082	0.00467	19441.1031	132.2274	14614.3460
205.0	2020.6726	13.3696	0.00471	19221.0744	130.6865	14448.9452
206.0	2024.0023	13.4341	0.00471	19260.3653	130.3627	14478.4811
207.0	2026.4421	13.4479	0.00467	19393.9541	132.0265	14578.9030
208.0	2028.0361	13.4174	0.00469	19323.2306	129.7732	14525.7384
209.0	2031.3979	13.4758	0.00465	19433.2449	131.4044	14608.4389
210.0	2033.4462	13.4596	0.00463	19543.2593	131.7227	14691.1393
211.0	2036.4610	13.4944	0.00465	19417.5286	127.5464	14596.6245
212.0	2039.1182	13.5046	0.00457	19755.4297	131.4740	14850.6330
213.0	2041.0451	13.4673	0.00454	19889.0186	132.5493	14951.0549
214.0	2044.2532	13.5227	0.00458	19731.8552	130.0335	14832.9114
215.0	2045.3647	13.4534	0.00455	19865.4441	133.6440	14933.3334
216.0	2048.0697	13.4717	0.00454	19818.2951	133.6265	14897.8903
217.0	2050.5297	13.4756	0.00450	20046.1819	140.0308	15069.1984
218.0	2053.4977	13.5242	0.00453	19896.8767	138.6327	14956.9621
219.0	2055.9895	13.5629	0.00454	19912.5931	138.9143	14968.7764
220.0	2056.9521	13.5133	0.00457	19723.9971	135.3173	14827.0043
221.0	2058.8537	13.5263	0.00457	19708.2807	134.8702	14815.1899
222.0	2060.6770	13.5388	0.00456	19779.0042	131.8112	14868.3545
223.0	2063.1263	13.5539	0.00455	19834.0114	131.4236	14909.7047
224.0	2065.3607	13.5458	0.00454	19849.7277	133.5333	14921.5190
225.0	2067.4918	13.5445	0.00454	19873.3022	135.1466	14939.2405
226.0	2068.8809	13.5147	0.00458	19668.9899	135.2285	14785.6540
227.0	2070.5546	13.4973	0.00460	19566.8338	131.4043	14708.8608
228.0	2072.3810	13.5038	0.00458	19676.8481	136.1824	14791.5612
229.0	2074.8105	13.5579	0.00457	19684.7062	135.5229	14797.4684
230.0	2076.0447	13.5286	0.00456	19779.0042	136.3390	14868.3545
231.0	2078.1265	13.5682	0.00459	19621.8409	131.8327	14750.2110
232.0	2079.7525	13.5744	0.00458	19637.5572	132.2394	14762.0254
233.0	2082.0399	13.6007	0.00456	19731.8552	135.1754	14832.9114
234.0	2084.8559	13.6697	0.00458	19621.8409	136.8011	14750.2110
235.0	2084.8503	13.5732	0.00457	19700.4226	130.5288	14809.2827
236.0	2086.4521	13.5640	0.00454	19818.2951	134.1088	14897.8903
237.0	2088.4292	13.5926	0.00456	19716.1389	137.4319	14821.0971
238.0	2089.6884	13.5890	0.00459	19590.4083	135.4904	14726.5823
239.0	2092.0048	13.6400	0.00459	19613.9828	135.9303	14744.3038
240.0	2092.7342	13.6000	0.00461	19488.2521	135.3560	14649.7891
241.0	2092.8900	13.5282	0.00462	19456.8194	129.6017	14626.1604
242.0	2095.3159	13.5741	0.00462	19456.8194	132.3693	14626.1604
243.0	2096.9132	13.5649	0.00459	19582.5501	131.1088	14720.6751
244.0	2098.1665	13.5395	0.00462	19496.1103	134.1065	14655.6962
245.0	2099.3348	13.5368	0.00463	19441.1031	132.8953	14614.3460
246.0	2101.4474	13.5933	0.00465	19331.0888	130.6351	14531.6456
247.0	2103.5357	13.6132	0.00464	19401.8123	132.3603	14584.8102
248.0	2105.0589	13.6196	0.00465	19370.3796	133.6656	14561.1815
249.0	2107.1094	13.6633	0.00470	19173.9254	128.5690	14413.5022
250.0	2108.5333	13.6529	0.00465	19378.2378	132.1494	14567.0886
251.0	2109.2331	13.6246	0.00466	19331.0888	133.6815	14531.6456

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252.0	2110.3287	13.6243	0.00466	19338.9469	134.8758	14537.5528
253.0	2111.2675	13.6045	0.00469	19197.4999	133.4911	14431.2237
254.0	2112.9118	13.6283	0.00468	19221.0744	129.6871	14448.9452
255.0	2113.6391	13.5877	0.00466	19315.3724	133.1278	14519.8313
256.0	2116.2341	13.6453	0.00468	19213.2163	132.3072	14443.0380
257.0	2115.4243	13.5180	0.00474	18977.4713	132.9938	14265.8228
258.0	2117.8660	13.5698	0.00476	18961.7550	129.0305	14254.0085
259.0	2119.4309	13.5914	0.00474	18993.1876	125.4780	14277.6372
260.0	2121.1289	13.5796	0.00472	19056.0530	124.6807	14324.8946
261.0	2123.0511	13.5986	0.00466	19354.6633	129.2129	14549.3671
262.0	2125.5020	13.6469	0.00466	19315.3724	127.8552	14519.8313
263.0	2126.5953	13.6223	0.00461	19551.1174	131.6130	14697.0465
264.0	2128.5722	13.6496	0.00462	19511.8266	131.0105	14667.5106
265.0	2129.0871	13.6155	0.00459	19606.1246	128.8229	14738.3967
266.0	2130.8374	13.6631	0.00458	19645.4154	129.2698	14767.9325
267.0	2130.8910	13.6241	0.00458	19629.6991	132.3004	14756.1182
268.0	2130.9069	13.5770	0.00462	19480.3939	131.0879	14643.8819
269.0	2131.4544	13.5574	0.00462	19472.5358	134.1494	14637.9747
270.0	2130.9575	13.4923	0.00466	19323.2306	135.8240	14525.7384
271.0	2132.8378	13.5571	0.00475	18993.1876	137.8983	14277.6372
272.0	2133.7682	13.5894	0.00472	19071.7693	130.5193	14336.7089
273.0	2134.2677	13.5816	0.00470	19142.4928	132.4078	14389.8735
274.0	2137.6058	13.7153	0.00472	19024.6203	126.7275	14301.2659
275.0	2137.7001	13.6483	0.00471	19150.3509	131.9854	14395.7806
276.0	2138.5302	13.6318	0.00470	19150.3509	133.6175	14395.7806
277.0	2139.5269	13.6536	0.00472	19071.7693	132.9815	14336.7089
278.0	2140.6546	13.6836	0.00473	19063.9111	134.2109	14330.8017
279.0	2141.4663	13.6903	0.00472	19095.3438	129.3090	14354.4304
280.0	2143.5846	13.7659	0.00477	18843.8825	132.2687	14165.4009
281.0	2142.6839	13.6864	0.00479	18765.3008	130.2392	14106.3292
282.0	2143.2320	13.6826	0.00478	18812.4498	129.9053	14141.7722
283.0	2143.8182	13.6641	0.00474	18961.7550	131.4000	14254.0085
284.0	2144.3565	13.6632	0.00475	18914.6060	129.8287	14218.5654
285.0	2145.3085	13.6779	0.00473	18969.6131	132.0084	14259.9157
286.0	2146.3169	13.6921	0.00474	18946.0386	131.4531	14242.1941
287.0	2146.4984	13.6637	0.00480	18726.0100	129.6516	14076.7933
288.0	2147.4511	13.6708	0.00475	18922.4641	131.8690	14224.4726
289.0	2149.8672	13.7601	0.00477	18843.8825	130.8704	14165.4009
290.0	2149.6390	13.7070	0.00474	18977.4713	130.6838	14265.8228
291.0	2150.6491	13.7246	0.00477	18836.0243	128.6565	14159.4937
292.0	2151.5681	13.7033	0.00471	19087.4856	130.2900	14348.5232
293.0	2154.0616	13.7968	0.00475	18946.0386	128.9577	14242.1941
294.0	2153.8632	13.7281	0.00471	19079.6275	129.5388	14342.6161
295.0	2155.3991	13.7681	0.00470	19166.0673	132.0533	14407.5950
296.0	2155.1024	13.7180	0.00470	19134.6346	133.4354	14383.9663
297.0	2154.6043	13.6574	0.00469	19181.7836	133.8939	14419.4093
298.0	2155.6624	13.6916	0.00476	18891.0315	130.1035	14200.8439
299.0	2157.1345	13.7431	0.00477	18883.1733	128.8075	14194.9367
300.0	2157.8534	13.7448	0.00476	18867.4570	128.1563	14183.1224
301.0	2159.0903	13.7741	0.00478	18820.3080	129.4332	14147.6794
302.0	2160.3637	13.8160	0.00476	18922.4641	132.1196	14224.4726
303.0	2160.7262	13.7977	0.00478	18812.4498	131.4892	14141.7722
304.0	2161.2965	13.7896	0.00479	18788.8753	130.1669	14124.0507
305.0	2160.7067	13.7004	0.00480	18773.1590	133.1115	14112.2363
306.0	2162.3892	13.7610	0.00483	18655.2865	127.9902	14023.6287
307.0	2162.5243	13.7197	0.00482	18702.4355	128.7455	14059.0718
308.0	2163.1500	13.7116	0.00482	18702.4355	126.5816	14059.0718
309.0	2164.7667	13.7635	0.00479	18820.3080	129.5124	14147.6794
310.0	2108.0434	13.4275	0.00479	16832.1919	109.6004	12653.1646
311.0	1961.4527	12.6211	0.00385	14160.4154	94.7044	10644.7258
312.0	1853.2702	12.1345	0.00282	12628.0730	83.2163	9492.8270
313.0	1777.7728	11.9216	0.00198	11795.1074	82.5988	8866.6667
314.0	1721.6121	11.7950	0.00142	10938.5673	74.2633	8222.7848

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315.0	1678.6715	11.7285	0.00102	10278.4813	69.8056	7726.5823
316.0	1644.2273	11.7487	0.00076	9830.5659	69.0160	7389.8734
317.0	1614.8276	11.7823	0.00059	9280.4942	62.2759	6976.3713
318.0	1587.2019	11.6797	0.00048	9099.7564	60.9517	6840.5063
319.0	1562.6040	11.6035	0.00044	8588.9756	60.4030	6456.5401
320.0	1539.4899	11.5911	0.00044	8172.4928	58.3935	6143.4599
321.0	1518.5425	11.6696	0.00045	7795.3008	53.4026	5859.9156
322.0	1497.4861	11.6395	0.00046	7583.1304	53.2461	5700.4220
323.0	1475.5455	11.4968	0.00052	7182.3639	50.3908	5399.1561
324.0	1454.2730	11.4056	0.00055	6805.1719	48.3608	5115.6118
325.0	1433.6221	11.3584	0.00061	6420.1218	46.2693	4826.1604
326.0	1413.1129	11.2793	0.00065	6145.0859	43.2499	4619.4093
327.0	1394.4306	11.3276	0.00069	6082.2206	42.0608	4572.1519
328.0	1376.2624	11.3350	0.00073	5901.4828	39.1345	4436.2869
329.0	1357.9811	11.3034	0.00074	5956.4900	41.5746	4477.6371
330.0	1338.5729	11.1874	0.00077	5830.7593	40.7619	4383.1224
331.0	1321.1397	11.2035	0.00081	5681.4541	39.5323	4270.8861
332.0	1303.4301	11.1872	0.00082	5728.6031	40.2714	4306.3291
333.0	1284.9178	11.0864	0.00083	5634.3051	39.0849	4235.4430
334.0	1267.2131	11.0075	0.00085	5547.8653	37.8292	4170.4641
335.0	1250.1078	10.9680	0.00085	5681.4541	39.9306	4270.8861
336.0	1233.3612	10.9497	0.00088	5469.2837	38.3495	4111.3924
337.0	1216.5535	10.9010	0.00087	5571.4398	37.9081	4188.1857
338.0	1200.4061	10.8804	0.00091	5367.1275	36.1748	4034.5992
339.0	1184.1554	10.8307	0.00088	5579.2980	39.0540	4194.0928
340.0	1167.0848	10.7012	0.00090	5469.2837	37.4551	4111.3924
341.0	1151.8826	10.7030	0.00090	5492.8582	38.4624	4129.1139
342.0	1136.5754	10.6849	0.00092	5477.1418	39.3159	4117.2996
343.0	1120.4222	10.5850	0.00092	5445.7092	38.9799	4093.6709
344.0	1104.5939	10.5072	0.00094	5374.9857	38.7495	4040.5063
345.0	1089.4555	10.4716	0.00097	5257.1132	37.6839	3951.8987
346.0	1074.8841	10.4617	0.00098	5123.5243	36.9974	3851.4768
347.0	1059.6097	10.3612	0.00098	5225.6805	37.4481	3928.2701
348.0	1045.4116	10.3574	0.00099	5107.8080	36.8839	3839.6625
349.0	1031.0437	10.2950	0.00099	5099.9498	37.0726	3833.7553
350.0	1016.3942	10.2053	0.00098	5115.6662	36.8078	3845.5696
351.0	1002.3517	10.1573	0.00100	5005.6518	35.9444	3762.8692
352.0	988.5989	10.1026	0.00100	4989.9355	36.4332	3751.0549
353.0	975.6166	10.1176	0.00101	4942.7865	36.2611	3715.6118
354.0	962.0575	10.0470	0.00102	4895.6375	35.9929	3680.1688
355.0	948.7901	9.9972	0.00105	4738.4742	35.0090	3562.0253
356.0	935.7925	9.9189	0.00104	4817.0559	34.9259	3621.0971
357.0	924.1288	9.9888	0.00104	4722.7579	33.5635	3550.2110
358.0	912.1926	9.9918	0.00103	4769.9069	35.0356	3585.6540
359.0	899.2203	9.8755	0.00099	4895.6375	36.3778	3680.1688
360.0	886.5616	9.7711	0.00102	4738.4742	34.5678	3562.0253
361.0	874.4065	9.6941	0.00103	4722.7579	35.1730	3550.2110
362.0	863.0362	9.6904	0.00103	4675.6089	34.9883	3514.7679
363.0	850.8280	9.5940	0.00102	4683.4670	35.6398	3520.6751
364.0	839.9585	9.6130	0.00103	4659.8925	34.8302	3502.9536
365.0	829.1623	9.6067	0.00100	4746.3324	35.7330	3567.9325
366.0	817.6098	9.5071	0.00103	4659.8925	34.7667	3502.9536
367.0	806.8269	9.4735	0.00100	4699.1834	35.0525	3532.4895
368.0	796.8242	9.5055	0.00100	4675.6089	35.0568	3514.7679
369.0	786.2475	9.4532	0.00100	4675.6089	35.0087	3514.7679
370.0	775.3760	9.3500	0.00098	4714.8997	35.7535	3544.3038
371.0	765.3804	9.3618	0.00100	4620.6017	35.1897	3473.4177
372.0	755.0718	9.2976	0.00101	4573.4527	34.9831	3437.9747
373.0	746.2327	9.3021	0.00103	4479.1547	34.1240	3367.0886
374.0	740.3880	9.2574	0.00104	4424.1476	33.9883	3325.7384
375.0	736.9957	9.3772	0.00108	4251.2679	32.9400	3195.7806
376.0	732.9085	9.4494	0.00108	4243.4097	32.9514	3189.8734
377.0	728.4263	9.4724	0.00112	4086.2464	31.6450	3071.7300

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378.0	722.8678	9.4506	0.00111	4094.1046	31.9491	3077.6371
379.0	718.8351	9.5028	0.00111	4086.2464	32.4821	3071.7300
380.0	713.3992	9.4629	0.00113	3960.5157	30.8451	2977.2152
381.0	709.0396	9.4925	0.00111	4015.5229	30.8504	3018.5654
382.0	704.5028	9.5089	0.00113	3929.0831	30.5765	2953.5865
383.0	701.1786	9.5935	0.00110	4054.8137	31.5577	3048.1013
384.0	697.2822	9.6502	0.00112	3968.3739	31.1829	2983.1224
385.0	692.2277	9.6232	0.00110	3999.8066	31.5691	3006.7511
386.0	687.6910	9.6091	0.00114	3881.9341	30.4678	2918.1435
387.0	682.4867	9.5490	0.00114	3889.7923	31.1904	2924.0506
388.0	677.4459	9.5221	0.00117	3803.3524	30.4403	2859.0717
389.0	673.9581	9.6013	0.00119	3693.3381	29.0458	2776.3713
390.0	670.2797	9.6482	0.00120	3630.4728	28.1432	2729.1139
391.0	666.2062	9.6824	0.00115	3764.0616	30.5277	2829.5359
392.0	661.8465	9.6800	0.00118	3646.1891	28.8960	2740.9283
393.0	659.2308	9.8084	0.00115	3740.4871	30.4627	2811.8144
394.0	654.3126	9.7699	0.00116	3677.6218	30.0064	2764.5570
395.0	649.2717	9.7221	0.00118	3606.8983	29.8296	2711.3924
396.0	646.2745	9.8309	0.00121	3528.3166	29.0795	2652.3207
397.0	641.6151	9.8156	0.00125	3402.5859	28.3418	2557.8059
398.0	638.0048	9.8542	0.00127	3347.5788	27.6723	2516.4557
399.0	632.8278	9.7700	0.00129	3300.4298	27.5904	2481.0127
400.0	629.5035	9.8258	0.00128	3316.1461	27.2722	2492.8270
401.0	626.6561	9.8954	0.00130	3261.1390	26.6493	2451.4768
402.0	622.9777	9.9121	0.00124	3371.1533	28.2868	2534.1772
403.0	619.7216	9.9776	0.00124	3355.4370	27.8742	2522.3629
404.0	616.7107	10.0614	0.00122	3402.5859	28.5478	2557.8059
405.0	611.8743	9.9825	0.00123	3371.1533	28.8805	2534.1772
406.0	608.3866	10.0320	0.00125	3300.4298	28.2302	2481.0127
407.0	604.2858	10.0186	0.00122	3347.5788	28.4215	2516.4557
408.0	599.8580	9.9949	0.00129	3166.8410	27.2065	2380.5907
409.0	596.7927	10.0724	0.00131	3096.1175	26.7946	2327.4262
410.0	592.5012	10.0433	0.00133	3033.2521	26.5518	2280.1688
411.0	589.0816	10.0889	0.00138	2946.8123	25.7526	2215.1899
412.0	585.6892	10.1330	0.00142	2836.7980	24.8636	2132.4895
413.0	582.0789	10.1496	0.00146	2766.0745	24.3970	2079.3249
414.0	578.4141	10.1625	0.00153	2648.2020	23.4009	1990.7173
415.0	574.4496	10.1553	0.00156	2593.1948	23.1420	1949.3671
416.0	571.3569	10.2048	0.00155	2608.9112	23.4427	1961.1814
417.0	567.0109	10.1403	0.00158	2546.0458	23.0504	1913.9241
418.0	564.7221	10.2635	0.00160	2498.8968	22.5036	1878.4810
419.0	561.3298	10.2776	0.00160	2475.3223	22.2790	1860.7595
420.0	557.9511	10.2785	0.00161	2459.6060	22.1619	1848.9452
421.0	555.4307	10.3679	0.00157	2498.8968	22.6566	1878.4810
422.0	551.7795	10.3642	0.00158	2483.1805	22.5243	1866.6667
423.0	547.5833	10.2747	0.00161	2404.5988	21.5252	1807.5949
424.0	544.9676	10.3497	0.00154	2491.0387	22.7135	1872.5738
425.0	540.9758	10.3032	0.00152	2506.7550	23.4009	1884.3882
426.0	537.7605	10.3140	0.00155	2451.7478	22.8767	1843.0380
427.0	534.7769	10.3505	0.00155	2420.3152	22.5018	1819.4093
428.0	531.6026	10.3559	0.00158	2365.3080	22.1091	1778.0591
429.0	528.5372	10.3963	0.00166	2255.2937	21.0644	1695.3587
430.0	524.8724	10.3752	0.00166	2263.1519	21.3953	1701.2658
431.0	522.5291	10.4762	0.00172	2176.7120	20.6030	1636.2869
432.0	518.5645	10.3955	0.00172	2160.9957	20.7201	1624.4726
433.0	515.6627	10.4151	0.00173	2129.5630	20.3224	1600.8439
434.0	511.9842	10.3571	0.00176	2082.4140	20.0715	1565.4008
435.0	509.3957	10.4337	0.00174	2090.2722	20.2994	1571.3080
436.0	506.5074	10.4626	0.00179	2058.8395	20.0244	1547.6793
437.0	503.7009	10.4732	0.00177	2050.9814	19.9955	1541.7722
438.0	500.8672	10.5138	0.00176	2043.1232	19.9556	1535.8650
439.0	498.1288	10.5536	0.00172	2066.6977	20.0932	1553.5865
440.0	494.1370	10.4224	0.00173	2043.1232	20.2045	1535.8650

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441.0	492.4885	10.5823	0.00177	1995.9742	19.5908	1500.4219
442.0	489.8046	10.6057	0.00175	1995.9742	19.7719	1500.4219
443.0	487.0117	10.6000	0.00167	2082.4140	20.5603	1565.4008
444.0	484.5322	10.6374	0.00167	2066.6977	20.6681	1553.5865
445.0	481.5622	10.6331	0.00169	2003.8324	20.1514	1506.3291
446.0	478.3742	10.5939	0.00163	2074.5559	21.1246	1559.4937
447.0	475.6630	10.6056	0.00161	2082.4140	21.0842	1565.4008
448.0	472.7203	10.6163	0.00161	2050.9814	20.8433	1541.7722
449.0	470.3497	10.6602	0.00155	2129.5630	21.9316	1600.8439
450.0	467.9928	10.7092	0.00160	2035.2650	21.1078	1529.9578
451.0	465.0501	10.6990	0.00160	2043.1232	21.1808	1535.8650
452.0	462.0528	10.6888	0.00160	2035.2650	21.1554	1529.9578
453.0	459.5596	10.7248	0.00167	1940.9670	20.3729	1459.0717
454.0	456.9302	10.7303	0.00162	1980.2579	20.8083	1488.6076
455.0	454.3826	10.7589	0.00170	1878.1017	19.9893	1411.8143
456.0	451.6306	10.7375	0.00170	1878.1017	19.8031	1411.8143
457.0	449.4508	10.8157	0.00169	1870.2435	19.7573	1405.9072
458.0	446.6034	10.8064	0.00176	1791.6619	18.9038	1346.8354
459.0	443.3609	10.6934	0.00173	1807.3782	19.1889	1358.6498
460.0	440.7587	10.7067	0.00171	1815.2364	19.3832	1364.5570
461.0	438.3746	10.7474	0.00175	1775.9456	19.0939	1335.0211
462.0	436.3719	10.8296	0.00171	1799.5201	19.3589	1352.7426
463.0	433.2111	10.7408	0.00168	1807.3782	19.7001	1358.6498
464.0	431.1539	10.7878	0.00163	1862.3854	20.1303	1400.0000
465.0	428.4428	10.7514	0.00166	1823.0946	20.1027	1370.4641
466.0	426.0041	10.7652	0.00169	1775.9456	19.4838	1335.0211
467.0	424.0695	10.8473	0.00174	1720.9384	19.1263	1293.6709
468.0	420.6499	10.7111	0.00181	1658.0731	18.4572	1246.4135
469.0	418.9061	10.7351	0.00179	1658.0731	18.5732	1246.4135
470.0	416.6173	10.7545	0.00178	1673.7894	18.8278	1258.2279
471.0	414.1786	10.8047	0.00181	1634.4986	18.7216	1228.6920
472.0	411.6718	10.7972	0.00183	1610.9241	18.3430	1210.9705
473.0	409.3966	10.8226	0.00190	1571.6332	17.9901	1181.4346
474.0	407.2032	10.8491	0.00192	1540.2006	17.6561	1157.8059
475.0	405.2414	10.8952	0.00195	1516.6261	17.3516	1140.0844
476.0	402.1488	10.7863	0.00194	1524.4842	17.6513	1145.9916
477.0	400.1188	10.8173	0.00186	1571.6332	18.0636	1181.4346
478.0	398.1570	10.8753	0.00187	1555.9169	18.0932	1169.6203
479.0	395.8000	10.8175	0.00191	1493.0516	17.4377	1122.3629
480.0	393.3477	10.8162	0.00188	1508.7679	17.3899	1134.1772
481.0	391.3859	10.8668	0.00179	1571.6332	18.4392	1181.4346
482.0	388.9472	10.8527	0.00180	1555.9169	18.6785	1169.6203
483.0	386.5767	10.8201	0.00182	1532.3424	18.1474	1151.8987
484.0	384.7920	10.8732	0.00180	1532.3424	17.9117	1151.8987
485.0	382.7075	10.9172	0.00185	1461.6189	17.2576	1098.7342
486.0	380.7866	10.9631	0.00184	1469.4771	17.7831	1104.6414
487.0	378.5795	10.9522	0.00180	1500.9097	18.0857	1128.2700
488.0	376.5359	10.9671	0.00182	1469.4771	17.8431	1104.6414
489.0	374.4787	10.9889	0.00178	1477.3352	18.0322	1110.5485
490.0	371.9174	10.9173	0.00179	1477.3352	18.2362	1110.5485
491.0	369.6967	10.9037	0.00184	1406.6117	17.5473	1057.3840
492.0	368.0346	10.9916	0.00191	1351.6046	16.8261	1016.0338
493.0	366.3862	11.0728	0.00202	1273.0229	15.8720	956.9620
494.0	364.0428	11.0409	0.00193	1335.8882	16.8756	1004.2194
495.0	361.8085	11.0047	0.00208	1225.8739	15.5382	921.5190
496.0	359.9012	11.0324	0.00205	1233.7321	15.4099	927.4262
497.0	357.7759	11.0273	0.00212	1194.4413	15.1238	897.8903
498.0	356.2773	11.1240	0.00213	1178.7249	15.0486	886.0760
499.0	354.2064	11.1056	0.00218	1155.1504	14.8117	868.3544

APPENDIX H

1400 F First Text File for Fortran Program

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0.00	25.89	25.72	24.22	25.48	23.40	25.36	25.98	25.99
1.00	25.89	25.73	24.20	25.49	23.42	25.39	25.98	26.01
2.00	26.22	25.84	24.24	25.53	23.41	25.44	25.96	30.19
3.00	29.96	28.13	24.41	26.99	23.47	26.73	27.35	73.52
4.00	37.09	33.99	24.97	31.91	23.49	30.09	32.13	127.99
5.00	46.46	42.44	26.91	39.68	23.51	35.02	39.43	169.53
6.00	57.29	52.68	30.84	49.46	23.51	41.17	48.24	200.90
7.00	68.90	63.87	36.22	60.33	23.54	47.80	58.09	225.04
8.00	80.87	75.60	42.40	71.87	23.57	55.02	68.47	244.24
9.00	93.13	87.69	48.69	83.83	23.58	61.62	79.31	260.20
10.00	105.36	99.79	54.83	95.84	23.61	68.18	90.37	273.94
11.00	117.44	111.84	60.40	107.84	23.59	75.18	101.47	286.07
12.00	129.49	123.86	65.04	119.82	23.63	82.69	112.64	297.18
13.00	141.19	135.61	70.12	131.56	23.59	88.67	123.66	307.44
14.00	152.68	147.13	74.26	143.09	23.58	94.18	134.75	316.97
15.00	163.95	158.44	78.09	154.44	23.60	100.93	145.69	325.99
16.00	174.91	169.41	80.89	165.43	23.60	107.09	156.27	334.62
17.00	185.76	180.22	84.13	176.22	23.58	112.43	166.74	343.09
18.00	196.53	190.96	86.94	186.97	23.61	117.97	177.21	351.54
19.00	207.16	201.52	89.12	197.52	23.59	124.39	187.58	359.90
20.00	217.48	211.83	91.72	207.84	23.61	130.70	197.73	368.14
21.00	227.70	222.02	94.22	218.03	23.67	137.16	207.77	376.35
22.00	237.81	232.03	96.33	228.06	23.62	142.51	217.80	384.51
23.00	247.74	241.98	98.51	238.03	23.62	149.57	227.64	392.61
24.00	257.54	251.82	100.81	247.87	23.66	155.89	237.34	400.65
25.00	267.47	261.66	103.01	257.74	23.69	160.92	247.33	408.77
26.00	276.48	270.66	104.58	266.74	23.67	168.59	256.24	416.30
27.00	285.88	280.03	107.04	276.12	23.67	174.53	265.64	424.14
28.00	295.17	289.24	108.82	285.34	23.69	180.31	274.89	431.57
29.00	304.26	298.28	110.95	294.38	23.72	187.89	284.00	438.93
30.00	313.21	307.17	112.57	303.29	23.74	193.47	292.92	446.38
31.00	322.04	315.94	114.63	312.06	23.72	199.77	301.73	453.89
32.00	330.67	324.60	116.51	320.74	23.73	206.36	310.34	461.41
33.00	339.39	333.18	118.34	329.31	23.76	211.28	319.04	468.99
34.00	347.82	341.59	120.23	337.74	23.79	217.14	327.47	476.47
35.00	356.14	349.87	122.38	346.04	23.77	224.48	335.80	483.88
36.00	364.41	358.07	124.67	354.24	23.75	230.49	344.06	491.26
37.00	372.52	366.11	126.51	362.28	23.80	236.71	352.14	498.51
38.00	380.53	374.03	128.23	370.21	23.82	242.93	360.13	505.69
39.00	388.54	381.96	130.04	378.13	23.84	249.74	368.13	512.89
40.00	396.26	389.62	131.78	385.79	23.83	255.40	375.79	519.88
41.00	403.89	397.22	133.91	393.39	23.83	261.92	383.43	526.83
42.00	411.60	404.76	135.02	400.92	23.86	268.26	391.19	533.76
43.00	419.02	412.12	137.44	408.23	23.88	273.98	398.41	540.56
44.00	426.28	419.41	138.93	415.55	23.89	280.01	405.81	547.22
45.00	433.54	426.60	140.41	422.71	23.92	285.49	412.93	553.76
46.00	440.66	433.62	142.67	429.74	23.91	291.39	420.21	560.03
47.00	447.59	440.49	144.18	436.55	23.92	297.34	426.93	566.41
48.00	454.55	447.33	146.40	443.41	23.92	303.56	434.04	572.77
49.00	461.41	454.09	148.29	450.17	23.95	309.98	440.97	579.08
50.00	467.74	460.54	149.28	456.60	23.99	313.96	447.15	585.10
51.00	474.42	467.02	151.26	463.06	23.96	320.13	453.99	591.14
52.00	480.59	473.35	152.67	469.39	23.99	324.68	460.05	597.06
53.00	487.29	479.92	154.66	475.95	24.02	330.29	466.87	603.22
54.00	492.97	485.61	155.62	481.58	24.00	335.80	472.33	608.57
55.00	498.98	491.57	158.02	487.51	23.98	342.93	478.36	614.20
56.00	504.94	497.47	159.10	493.44	23.99	346.82	484.54	619.71
57.00	510.83	503.28	160.87	499.26	24.01	352.26	490.47	625.21
58.00	516.49	508.93	162.39	504.89	24.04	356.87	496.09	630.62
59.00	522.16	514.51	164.62	510.38	24.06	363.06	501.67	636.02
60.00	527.74	520.02	166.17	515.87	24.08	368.19	507.26	641.27
61.00	533.12	525.43	167.24	521.26	24.09	372.95	512.64	646.38
62.00	538.43	530.71	168.23	526.53	24.12	376.48	517.96	651.30

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63.00	543.62	535.87	170.22	531.67	24.13	381.22	523.17	656.15
64.00	548.76	540.99	171.94	536.78	24.15	386.19	528.37	660.99
65.00	553.72	545.95	173.02	541.69	24.15	389.96	533.30	665.78
66.00	558.70	550.84	173.88	546.54	24.20	395.86	538.24	670.56
67.00	563.51	555.67	175.78	551.37	24.17	399.92	543.09	675.27
68.00	568.23	560.36	176.92	556.04	24.23	402.38	547.84	679.68
69.00	572.96	564.98	177.17	560.61	24.24	407.43	552.61	683.98
70.00	577.53	569.54	180.04	565.16	24.26	412.57	557.21	688.33
71.00	581.96	573.99	180.51	569.59	24.21	415.83	561.63	692.57
72.00	586.37	578.33	181.81	573.88	24.24	421.12	566.07	696.71
73.00	590.64	582.64	183.31	578.18	24.23	424.75	570.39	700.71
74.00	594.86	586.79	184.45	582.24	24.29	430.38	574.53	704.63
75.00	598.99	590.91	186.14	586.39	24.29	432.29	578.82	708.52
76.00	603.04	594.96	187.10	590.44	24.31	435.83	582.96	712.30
77.00	606.96	598.89	188.35	594.31	24.34	440.56	586.78	715.99
78.00	610.97	602.74	189.77	598.13	24.32	444.17	590.97	719.66
79.00	614.68	606.60	190.73	601.98	24.34	446.64	594.65	723.29
80.00	618.34	610.27	191.15	605.63	24.37	450.72	598.37	726.72
81.00	622.03	613.86	192.62	609.19	24.38	454.24	602.16	730.06
82.00	625.48	617.43	193.29	612.75	24.36	457.27	605.57	733.34
83.00	628.98	620.87	193.18	616.18	24.42	460.86	609.13	736.57
84.00	632.42	624.28	194.98	619.55	24.39	463.92	612.61	739.81
85.00	635.81	627.63	194.96	622.87	24.41	467.62	616.02	743.02
86.00	639.00	630.89	195.89	626.10	24.42	471.07	619.21	746.16
87.00	642.28	634.14	198.22	629.31	24.43	474.08	622.62	749.28
88.00	645.51	637.30	198.90	632.41	24.51	476.74	625.80	752.31
89.00	648.52	640.37	199.39	635.47	24.50	480.81	628.88	755.23
90.00	651.51	643.38	201.11	638.43	24.55	482.97	631.89	758.09
91.00	654.46	646.36	201.20	641.42	24.53	485.66	634.97	760.84
92.00	657.36	649.23	203.12	644.25	24.52	488.28	637.90	763.59
93.00	660.19	652.08	203.87	647.10	24.59	491.82	640.80	766.33
94.00	663.01	654.88	205.02	649.85	24.61	494.69	643.59	769.06
95.00	665.69	657.61	204.73	652.59	24.61	498.30	646.32	771.73
96.00	668.41	660.29	206.68	655.23	24.63	499.67	649.09	774.40
97.00	671.06	662.96	207.61	657.91	24.69	502.41	651.82	776.96
98.00	673.67	665.51	207.47	660.41	24.71	504.89	654.38	779.43
99.00	676.17	668.05	208.46	662.96	24.69	508.20	656.98	781.84
100.00	678.74	670.54	210.48	665.39	24.69	510.49	659.62	784.12
101.00	681.06	672.95	210.46	667.79	24.72	513.13	661.94	786.33
102.00	683.51	675.32	211.36	670.12	24.79	514.71	664.38	788.58
103.00	685.85	677.66	211.35	672.48	24.82	518.19	666.79	790.82
104.00	688.07	679.95	211.44	674.75	24.85	521.12	668.98	793.02
105.00	690.39	682.17	213.41	676.93	24.86	522.09	671.38	795.18
106.00	692.61	684.37	213.73	679.11	24.84	525.37	673.64	797.30
107.00	694.65	686.50	215.22	681.26	24.87	527.27	675.74	799.33
108.00	696.86	688.59	214.78	683.34	24.93	530.24	678.06	801.36
109.00	698.88	690.68	214.56	685.44	24.99	531.47	680.03	803.33
110.00	700.99	692.69	216.96	687.37	24.93	533.41	682.21	805.28
111.00	702.92	694.66	217.25	689.33	25.01	535.99	684.09	807.13
112.00	704.83	696.62	217.37	691.28	25.05	536.69	686.07	808.99
113.00	706.76	698.52	218.66	693.13	25.02	538.01	687.95	810.81
114.00	708.63	700.38	218.07	695.03	25.07	541.38	689.91	812.59
115.00	710.56	702.23	219.37	696.84	25.12	542.62	691.89	814.40
116.00	712.29	704.01	219.94	698.59	25.09	545.48	693.66	816.14
117.00	714.06	705.75	220.62	700.34	25.14	546.84	695.44	817.90
118.00	715.83	707.48	220.29	702.06	25.13	549.59	697.19	819.58
119.00	717.52	709.17	222.02	703.75	25.13	550.91	698.98	821.17
120.00	719.14	710.82	222.56	705.39	25.17	552.59	700.61	822.73
121.00	720.82	712.47	223.21	707.03	25.24	551.89	702.33	824.31
122.00	722.40	714.06	223.51	708.58	25.30	555.39	703.86	825.84
123.00	724.02	715.64	223.39	710.13	25.32	557.43	705.58	827.36
124.00	725.49	717.17	224.57	711.62	25.32	558.38	707.04	828.87
125.00	726.99	718.67	225.91	713.11	25.34	560.13	708.62	830.30

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126.00	728.48	720.14	224.42	714.61	25.37	561.42	710.16	831.72
127.00	729.98	721.59	224.23	716.03	25.38	563.98	711.69	833.10
128.00	731.37	723.01	225.43	717.40	25.38	565.02	713.14	834.42
129.00	732.76	724.38	226.74	718.74	25.43	565.80	714.48	835.75
130.00	734.17	725.73	226.17	720.12	25.42	568.29	715.97	837.03
131.00	735.44	727.04	226.89	721.40	25.39	570.21	717.24	838.29
132.00	736.79	728.34	227.45	722.68	25.47	569.81	718.63	839.58
133.00	738.11	729.64	227.83	723.92	25.44	571.77	719.98	840.83
134.00	739.34	730.90	228.33	725.17	25.53	573.64	721.23	841.96
135.00	740.57	732.13	229.14	726.37	25.48	575.43	722.51	843.12
136.00	741.81	733.34	228.67	727.58	25.51	576.90	723.70	844.31
137.00	743.08	734.56	229.59	728.80	25.54	577.16	725.05	845.50
138.00	744.33	735.78	229.24	729.97	25.60	577.43	726.23	846.71
139.00	745.59	736.99	228.68	731.13	25.59	580.24	727.43	847.92
140.00	746.81	738.20	230.11	732.28	25.55	582.48	728.63	849.19
141.00	747.99	739.36	231.10	733.41	25.61	584.10	729.76	850.31
142.00	749.21	740.54	230.84	734.58	25.68	584.38	731.01	851.40
143.00	750.36	741.71	232.12	735.73	25.68	585.66	732.17	852.53
144.00	751.48	742.86	232.81	736.87	25.74	584.16	733.22	853.59
145.00	752.70	744.03	232.78	738.04	25.81	586.51	734.51	854.62
146.00	753.86	745.18	232.95	739.12	25.74	587.01	735.59	855.69
147.00	754.95	746.31	233.33	740.27	25.80	590.11	736.71	856.72
148.00	756.16	747.44	232.56	741.40	25.81	591.42	737.88	857.88
149.00	757.27	748.57	233.68	742.47	25.77	592.77	738.93	859.08
150.00	758.37	749.67	235.35	743.58	25.84	593.77	740.07	860.17
151.00	759.45	750.76	234.27	744.72	25.86	593.27	741.16	861.04
152.00	760.54	751.84	234.76	745.78	25.89	594.79	742.16	861.95
153.00	761.61	752.89	236.00	746.86	25.89	595.87	743.35	862.89
154.00	762.57	753.90	236.36	747.85	25.91	598.43	744.26	863.83
155.00	763.58	754.89	235.63	748.84	26.00	598.13	745.19	864.75
156.00	764.62	755.89	235.97	749.91	25.99	597.79	746.37	865.54
157.00	765.56	756.86	236.79	750.86	26.01	600.47	747.29	866.42
158.00	766.57	757.82	236.48	751.81	26.20	600.61	748.26	867.43
159.00	767.57	758.79	236.33	752.72	26.17	601.97	749.26	868.47
160.00	768.59	759.76	236.19	753.64	26.12	602.21	750.27	869.49
161.00	769.53	760.70	236.96	754.49	26.06	604.53	751.14	870.47
162.00	770.51	761.62	237.92	755.34	25.98	604.02	752.08	871.38
163.00	771.33	762.51	239.12	756.26	26.05	606.26	753.00	872.16
164.00	772.22	763.37	239.08	757.13	26.10	607.09	753.92	872.96
165.00	773.07	764.21	237.83	757.97	26.14	606.66	754.68	873.78
166.00	773.98	765.08	238.35	758.83	26.26	607.85	755.56	874.60
167.00	774.85	765.93	239.18	759.63	26.17	609.79	756.53	875.31
168.00	775.54	766.71	240.91	760.41	26.11	610.91	757.27	875.99
169.00	776.31	767.45	240.63	761.19	26.27	609.94	758.11	876.63
170.00	777.07	768.21	240.30	761.98	26.28	611.49	758.88	877.31
171.00	777.83	768.96	240.17	762.71	26.28	612.56	759.67	878.02
172.00	778.57	769.67	240.28	763.45	26.33	613.91	760.43	878.70
173.00	779.32	770.41	240.77	764.18	26.39	613.54	761.21	879.45
174.00	780.06	771.14	240.09	764.89	26.31	616.11	761.94	880.27
175.00	780.80	771.85	241.26	765.58	26.30	616.01	762.74	881.02
176.00	781.54	772.55	241.13	766.26	26.36	616.19	763.49	881.73
177.00	782.19	773.26	241.37	766.95	26.37	616.92	764.16	882.44
178.00	782.86	773.93	241.92	767.59	26.32	618.11	764.95	883.07
179.00	783.50	774.59	242.76	768.27	26.34	620.32	765.66	883.61
180.00	784.17	775.24	242.01	768.97	26.46	617.93	766.38	884.21
181.00	784.85	775.88	240.44	769.58	26.45	621.66	766.96	884.93
182.00	785.48	776.56	241.33	770.24	26.44	621.90	767.66	885.62
183.00	786.19	777.20	242.23	770.80	26.55	621.06	768.33	886.23
184.00	786.88	777.84	242.98	771.41	26.48	621.95	769.02	886.83
185.00	787.49	778.46	242.31	771.93	26.38	622.28	769.63	887.48
186.00	788.06	779.07	243.63	772.53	26.50	624.44	770.24	888.09
187.00	788.66	779.64	244.22	773.16	26.41	625.51	770.93	888.63
188.00	789.26	780.21	243.77	773.71	26.52	625.03	771.56	889.19

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189.00	789.81	780.78	244.37	774.27	26.56	625.36	772.06	889.72
190.00	790.39	781.34	243.14	774.86	26.52	627.22	772.65	890.31
191.00	791.01	781.93	244.46	775.39	26.65	627.10	773.30	890.99
192.00	791.53	782.47	244.60	775.99	26.61	627.83	773.91	891.43
193.00	792.06	782.98	243.62	776.52	26.53	629.31	774.47	891.82
194.00	792.62	783.50	244.61	777.00	26.57	629.92	775.01	892.39
195.00	793.14	784.05	244.91	777.57	26.67	628.92	775.57	892.97
196.00	793.72	784.58	245.93	778.02	26.74	630.54	776.07	893.57
197.00	794.26	785.12	245.34	778.57	26.73	631.13	776.61	894.06
198.00	794.83	785.66	245.67	779.04	26.71	631.29	777.21	894.57
199.00	795.33	786.16	245.53	779.51	26.67	631.64	777.74	895.03
200.00	795.86	786.63	244.61	779.98	26.71	631.34	778.20	895.49
201.00	796.30	787.11	246.35	780.46	26.74	635.41	778.69	895.93
202.00	796.76	787.54	246.32	780.89	26.78	634.08	779.26	896.33
203.00	797.10	787.98	246.25	781.40	26.78	634.83	779.59	896.71
204.00	797.60	788.41	247.05	781.91	26.89	635.61	780.19	897.08
205.00	797.99	788.83	247.19	782.32	26.92	636.48	780.59	897.51
206.00	798.44	789.26	246.46	782.83	26.96	636.83	781.12	897.95
207.00	798.91	789.72	247.42	783.27	26.93	636.49	781.57	898.45
208.00	799.33	790.17	247.37	783.71	26.82	637.41	782.03	898.90
209.00	799.77	790.58	247.14	784.10	26.94	637.43	782.44	899.41
210.00	800.30	790.98	248.90	784.48	27.02	635.43	783.08	899.83
211.00	800.62	791.34	249.71	784.89	26.75	637.01	783.54	900.08
212.00	800.78	791.69	249.65	785.34	26.89	637.47	783.69	900.39
213.00	801.24	792.08	249.43	785.77	26.99	634.61	784.13	900.74
214.00	801.66	792.49	250.03	786.11	26.95	636.03	784.51	901.14
215.00	801.99	792.86	250.03	786.43	26.92	636.29	784.82	901.50
216.00	802.41	793.23	249.97	786.83	26.89	640.04	785.39	901.73
217.00	802.80	793.53	249.46	787.14	26.91	640.97	785.87	902.00
218.00	803.02	793.81	249.51	787.53	26.96	638.07	786.19	902.27
219.00	803.27	794.16	250.20	787.92	27.06	639.47	786.41	902.63
220.00	803.56	794.50	250.01	788.26	27.04	639.17	786.67	903.03
221.00	804.09	794.83	250.23	788.57	27.11	639.62	787.33	903.44
222.00	804.26	795.16	250.48	788.97	27.14	639.29	787.47	903.78
223.00	804.74	795.48	250.83	789.30	26.98	643.29	788.18	904.11
224.00	804.83	795.76	250.77	789.64	27.31	642.59	788.27	904.39
225.00	805.03	796.04	251.06	790.06	27.32	643.53	788.66	904.58
226.00	805.31	796.33	251.18	790.35	27.26	643.33	788.94	904.86
227.00	805.54	796.62	251.58	790.68	27.43	641.41	789.16	905.14
228.00	805.81	796.90	251.97	790.98	27.42	641.06	789.39	905.43
229.00	806.62	797.43	251.38	791.45	27.20	644.08	790.46	905.84
230.00	806.58	797.54	251.65	791.62	27.32	642.38	790.27	905.89
231.00	807.09	797.88	251.88	791.95	27.41	646.31	790.97	906.24
232.00	807.11	798.04	251.23	792.17	27.53	644.98	790.96	906.36
233.00	807.31	798.34	252.47	792.44	27.60	643.31	791.02	906.64
234.00	808.12	798.91	250.94	792.93	27.36	643.00	792.04	907.26
235.00	808.18	798.96	251.75	792.93	27.28	646.21	791.98	907.34
236.00	808.28	799.13	251.47	793.26	27.27	647.23	792.27	907.41
237.00	808.76	799.53	252.91	793.56	27.12	645.23	792.80	907.84
238.00	808.75	799.66	252.52	793.68	27.30	645.87	792.69	907.94
239.00	809.03	799.88	252.46	793.87	27.28	647.56	793.09	908.19
240.00	809.19	800.09	252.24	794.09	27.18	647.24	793.28	908.40
241.00	809.50	800.31	252.02	794.28	27.37	649.58	793.64	908.64
242.00	809.62	800.54	252.98	794.55	27.13	648.09	793.79	908.82
243.00	809.82	800.74	252.79	794.78	27.23	646.38	793.92	909.07
244.00	810.15	800.97	252.27	794.97	27.43	649.18	794.34	909.35
245.00	810.28	801.22	252.73	795.25	27.46	645.97	794.44	909.56
246.00	810.58	801.46	252.11	795.45	27.33	643.88	794.69	909.78
247.00	810.84	801.72	252.62	795.68	27.38	650.08	795.01	910.03
248.00	811.15	801.99	253.00	795.79	27.59	647.18	795.13	910.34
249.00	811.45	802.22	253.99	795.88	27.44	649.71	795.36	910.67
250.00	811.69	802.46	253.76	796.16	27.55	649.59	795.66	910.89
251.00	812.00	802.68	253.07	796.32	27.47	650.03	795.88	911.17

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252.00	812.16	802.89	253.79	796.56	27.47	650.46	796.04	911.28
253.00	812.47	803.09	254.07	796.77	27.56	650.11	796.41	911.54
254.00	812.67	803.32	253.72	796.89	27.56	649.38	796.47	911.83
255.00	812.82	803.49	253.49	797.08	27.22	649.18	796.69	912.07
256.00	812.94	803.63	253.34	797.31	27.27	651.37	796.92	912.13
257.00	813.08	803.77	253.60	797.55	27.48	651.69	797.18	912.24
258.00	813.22	803.94	253.83	797.77	27.90	650.27	797.33	912.44
259.00	813.44	804.16	254.53	797.93	27.82	653.38	797.50	912.69
260.00	813.67	804.36	253.89	798.15	27.93	651.18	797.73	912.87
261.00	813.82	804.53	254.05	798.38	27.88	651.32	797.84	912.97
262.00	814.19	804.73	254.57	798.47	27.72	652.06	798.19	913.07
263.00	814.19	804.89	254.83	798.57	27.78	650.18	798.07	913.22
264.00	814.41	805.04	255.19	798.78	27.83	651.04	798.41	913.34
265.00	814.52	805.17	255.26	798.94	27.87	652.35	798.50	913.44
266.00	814.65	805.33	255.21	799.15	27.75	650.56	798.63	913.54
267.00	814.88	805.50	255.23	799.32	27.93	652.96	798.91	913.72
268.00	815.01	805.64	254.90	799.41	27.73	653.37	798.97	913.87
269.00	815.17	805.77	255.26	799.58	27.81	653.28	799.18	914.03
270.00	815.34	805.94	255.17	799.73	27.84	654.07	799.36	914.20
271.00	815.57	806.10	254.71	799.82	27.83	655.22	799.60	914.39
272.00	815.64	806.24	254.29	799.97	27.87	653.33	799.68	914.52
273.00	815.81	806.35	255.11	800.09	27.78	653.72	799.87	914.67
274.00	815.89	806.47	254.61	800.23	27.94	654.62	799.99	914.84
275.00	816.08	806.61	254.64	800.39	27.94	653.32	800.20	915.11
276.00	816.39	806.76	254.99	800.48	27.90	654.63	800.63	915.37
277.00	816.49	806.96	255.24	800.59	27.88	654.81	800.53	915.54
278.00	816.69	807.12	255.53	800.67	27.83	655.33	800.76	915.69
279.00	816.86	807.26	255.34	800.80	27.75	655.10	801.06	915.71
280.00	816.82	807.34	255.61	800.85	27.89	656.28	800.86	915.73
281.00	816.99	807.46	255.72	800.98	28.20	652.64	801.06	915.81
282.00	817.06	807.54	255.40	801.18	28.28	657.48	801.27	915.86
283.00	817.18	807.62	255.26	801.28	28.27	658.59	801.39	915.90
284.00	817.18	807.69	255.63	801.39	28.21	656.47	801.33	915.91
285.00	817.33	807.81	255.82	801.54	28.39	657.57	801.52	916.08
286.00	817.42	807.92	256.01	801.64	28.38	658.61	801.59	916.26
287.00	817.44	807.98	255.49	801.81	28.38	659.13	801.73	916.32
288.00	817.51	808.05	255.97	801.98	28.47	657.10	801.84	916.40
289.00	817.59	808.14	256.02	802.10	28.50	658.04	801.97	916.54
290.00	817.67	808.28	255.29	802.27	28.59	657.58	802.07	916.65
291.00	817.79	808.36	255.42	802.41	28.53	657.77	802.27	916.76
292.00	817.83	808.45	254.83	802.53	28.52	658.94	802.28	916.83
293.00	817.97	808.55	254.85	802.68	28.49	659.99	802.49	916.84
294.00	818.02	808.62	255.93	802.81	28.64	659.36	802.59	916.88
295.00	818.12	808.73	256.58	802.96	28.54	657.10	802.69	916.97
296.00	818.23	808.83	255.69	803.02	28.51	662.19	802.92	917.09
297.00	818.23	808.89	256.18	803.12	28.67	659.16	802.93	917.17
298.00	817.12	808.65	256.11	803.17	28.75	656.71	803.07	912.32
299.00	811.62	805.99	254.12	801.79	28.90	652.21	802.07	878.88
300.00	805.53	801.34	247.74	798.03	28.73	649.66	798.54	848.89
301.00	799.07	795.70	241.12	792.84	28.62	645.98	793.31	827.93
302.00	792.47	789.49	236.06	786.76	28.54	641.96	787.38	812.43
303.00	785.82	783.06	230.22	780.40	28.44	636.58	781.26	800.19
304.00	779.23	776.63	226.64	773.97	28.27	632.16	775.13	790.22
305.00	772.93	770.33	222.48	767.61	28.18	623.21	769.22	781.73
306.00	766.68	764.19	220.17	761.48	28.06	617.23	763.41	774.13
307.00	760.81	758.32	217.23	755.60	27.98	613.46	757.90	767.26
308.00	755.24	752.67	214.53	749.96	27.88	606.69	752.77	760.82
309.00	749.92	747.36	212.53	744.63	27.91	604.22	747.67	754.79
310.00	744.89	742.54	209.77	739.89	27.85	598.47	742.73	749.13
311.00	740.52	738.07	208.36	735.36	27.74	593.29	738.62	743.77
312.00	736.16	733.67	206.18	731.09	27.64	583.12	734.75	738.67
313.00	731.79	729.26	205.06	726.58	27.79	579.53	730.62	734.07
314.00	727.35	724.91	204.38	722.19	27.77	579.72	726.26	729.86

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315.00	722.99	720.57	202.22	718.01	27.72	571.29	722.19	725.75
316.00	718.76	716.13	200.79	713.51	27.67	567.48	718.07	721.68
317.00	714.36	711.70	198.93	708.99	27.72	561.69	713.49	717.61
318.00	709.74	707.24	197.94	704.53	27.66	555.16	708.72	713.47
319.00	705.23	702.72	195.56	700.15	27.63	550.40	704.24	709.22
320.00	700.77	698.22	194.23	695.63	27.67	547.61	699.66	705.01
321.00	696.19	693.66	193.51	691.17	27.79	542.07	695.11	700.72
322.00	691.67	689.11	191.05	686.65	27.78	535.70	690.49	696.37
323.00	687.23	684.58	189.60	682.06	27.77	530.88	685.98	692.03
324.00	682.72	680.03	188.76	677.57	27.62	527.31	681.48	687.61
325.00	678.11	675.44	187.16	673.08	27.52	520.04	676.89	683.16
326.00	673.58	670.83	186.17	668.43	27.54	515.06	672.21	678.73
327.00	668.98	666.22	184.11	663.98	27.57	512.26	667.70	674.25
328.00	664.27	661.58	183.48	659.48	27.63	505.51	662.86	669.71
329.00	659.79	657.04	181.41	654.98	27.54	502.01	658.44	665.26
330.00	655.18	652.54	179.97	650.57	27.58	495.17	653.77	660.84
331.00	650.73	648.02	178.70	646.08	27.62	490.15	649.46	656.40
332.00	646.29	643.54	177.02	641.62	27.72	485.66	645.00	651.99
333.00	641.87	639.12	176.14	637.19	27.64	482.30	640.48	647.61
334.00	637.48	634.67	174.31	632.77	27.64	475.76	636.07	643.23
335.00	633.08	630.27	172.94	628.35	27.52	471.94	631.64	638.85
336.00	628.68	625.88	172.15	624.04	27.53	470.16	627.25	634.59
337.00	624.23	621.47	170.81	619.64	27.53	464.24	622.78	630.20
338.00	619.89	617.14	168.80	615.36	27.33	461.53	618.43	625.87
339.00	615.52	612.82	168.07	611.11	27.49	456.93	614.06	621.54
340.00	611.22	608.50	166.05	606.91	27.51	452.99	609.77	617.20
341.00	606.94	604.23	164.59	602.69	27.29	451.38	605.47	612.94
342.00	602.69	599.95	164.21	598.65	27.71	444.43	601.34	608.68
343.00	598.52	595.71	162.04	594.41	27.63	437.46	597.12	604.46
344.00	594.41	591.54	160.73	590.24	27.64	434.83	592.91	600.31
345.00	590.18	587.43	159.48	586.14	27.64	428.40	588.59	596.19
346.00	586.17	583.33	159.36	582.08	27.63	426.18	584.68	592.05
347.00	582.04	579.28	157.78	577.88	27.62	421.44	580.32	587.97
348.00	578.01	575.30	155.70	573.86	27.76	418.27	576.31	583.96
349.00	574.03	571.29	154.79	569.92	27.76	413.17	572.41	579.88
350.00	570.06	567.32	153.78	565.87	27.62	409.69	568.39	575.91
351.00	566.11	563.38	152.11	561.92	27.61	406.45	564.43	571.94
352.00	562.21	559.46	151.44	558.02	27.66	401.29	560.49	567.97
353.00	558.38	555.59	150.37	554.15	27.52	398.84	556.67	564.08
354.00	554.51	551.76	149.43	550.32	27.39	394.61	552.77	560.21
355.00	550.66	547.92	148.71	546.51	27.36	393.14	548.92	556.34
356.00	546.88	544.14	148.16	542.77	27.08	395.09	545.24	552.53
357.00	543.02	540.37	146.79	539.07	27.34	390.41	541.43	548.71
358.00	539.20	536.59	146.09	535.39	27.74	384.84	537.66	544.88
359.00	535.49	532.91	144.34	531.76	27.71	380.07	533.93	541.13
360.00	531.85	529.26	143.27	528.09	27.69	374.27	530.30	537.44
361.00	528.22	525.64	141.68	524.46	27.69	369.91	526.60	533.77
362.00	524.69	522.09	140.17	520.88	27.59	368.53	523.08	530.16
363.00	521.14	518.55	139.83	517.35	27.61	365.33	519.48	526.59
364.00	517.63	515.02	138.44	513.79	27.66	359.61	515.93	523.03
365.00	514.14	511.55	137.07	510.36	27.48	358.14	512.36	519.53
366.00	510.71	508.11	136.26	506.87	27.35	354.67	508.92	516.04
367.00	507.23	504.67	135.87	503.49	27.33	353.52	505.48	512.54
368.00	503.87	501.29	134.56	500.14	27.19	347.24	502.11	509.10
369.00	500.50	497.93	134.13	496.84	27.17	349.43	498.79	505.67
370.00	497.11	494.54	133.08	493.47	27.13	347.89	495.36	502.24
371.00	493.71	491.22	132.07	490.27	27.36	342.77	491.99	498.86
372.00	490.48	487.98	130.72	487.03	27.25	335.81	488.70	495.53
373.00	487.23	484.76	129.41	483.78	27.21	332.98	485.43	492.24
374.00	484.02	481.56	128.42	480.56	27.19	329.61	482.19	488.98
375.00	480.81	478.37	127.47	477.35	27.16	326.70	478.98	485.76
376.00	477.65	475.21	126.71	474.13	27.33	324.63	475.79	482.55
377.00	474.53	472.09	125.29	470.99	27.33	319.75	472.62	479.39

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378.00	471.46	469.02	124.37	467.87	27.20	316.75	469.44	476.26
379.00	468.35	465.93	123.74	464.77	27.15	316.12	466.33	473.13
380.00	465.30	462.88	123.42	461.67	27.17	313.68	463.24	470.06
381.00	462.23	459.84	122.98	458.67	27.29	313.79	460.28	466.98
382.00	459.19	456.83	121.94	455.69	27.24	310.20	457.25	463.88
383.00	456.19	453.83	121.35	452.70	27.32	307.76	454.30	460.84
384.00	453.19	450.88	120.23	449.76	27.24	305.63	451.29	457.83
385.00	450.27	447.96	119.42	446.82	27.16	302.80	448.32	454.84
386.00	447.39	445.09	118.77	443.94	27.05	298.40	445.47	451.91
387.00	444.47	442.19	118.24	441.08	27.03	297.53	442.64	448.98
388.00	441.54	439.30	117.32	438.23	27.03	294.89	439.74	446.05
389.00	438.63	436.45	116.29	435.40	27.09	291.98	436.86	443.17
390.00	435.85	433.66	114.98	432.59	27.00	288.79	434.04	440.33
391.00	433.04	430.87	114.91	429.83	26.97	287.06	431.24	437.49
392.00	430.29	428.09	114.24	427.07	26.96	285.68	428.57	434.70
393.00	427.51	425.36	113.68	424.38	26.96	281.57	425.82	431.93
394.00	424.79	422.64	112.70	421.66	26.93	279.38	423.08	429.17
395.00	422.09	419.96	111.81	418.99	26.99	279.55	420.43	426.46
396.00	419.41	417.31	111.16	416.35	27.23	277.03	417.76	423.76
397.00	416.77	414.68	109.96	413.73	27.02	274.82	415.06	421.07
398.00	414.11	412.03	109.28	411.13	26.96	273.90	412.48	418.39
399.00	411.49	409.43	109.22	408.58	27.17	270.42	409.84	415.76
400.00	408.91	406.87	107.72	406.02	27.07	267.21	407.27	413.14
401.00	406.36	404.33	107.58	403.44	26.86	264.99	404.70	410.54
402.00	403.82	401.82	107.07	400.91	27.09	264.44	402.22	407.99
403.00	401.27	399.33	106.80	398.40	26.97	262.86	399.64	405.46
404.00	398.76	396.82	106.44	395.91	27.08	261.52	397.23	402.92
405.00	396.24	394.33	105.57	393.46	27.13	258.89	394.78	400.42
406.00	393.84	391.92	104.23	391.07	27.08	255.92	392.43	397.95
407.00	391.39	389.51	103.97	388.65	27.05	253.29	389.94	395.50
408.00	389.04	387.13	103.70	386.26	27.19	251.96	387.60	393.06
409.00	386.61	384.75	102.72	383.91	27.03	248.45	385.13	390.63
410.00	384.19	382.34	101.48	381.48	26.82	248.25	382.67	388.18
411.00	381.91	380.06	101.02	379.26	26.98	247.15	380.43	385.89
412.00	379.58	377.75	101.18	376.98	27.01	246.22	378.05	383.54
413.00	377.32	375.48	100.09	374.67	26.96	242.79	375.81	381.23
414.00	375.02	373.25	99.31	372.41	26.86	242.11	373.50	378.96
415.00	372.81	371.02	98.43	370.14	26.77	238.59	371.29	376.68
416.00	370.60	368.79	98.12	367.89	26.78	237.42	369.05	374.42
417.00	368.37	366.58	97.73	365.72	26.99	236.81	366.84	372.17
418.00	366.12	364.37	97.23	363.52	26.97	233.17	364.56	369.93
419.00	363.24	361.52	96.34	360.67	26.88	232.01	361.73	367.03
420.00	361.74	360.03	95.67	359.20	26.87	230.38	360.25	365.52
421.00	359.61	357.91	95.84	357.10	26.91	231.06	358.18	363.37
422.00	357.47	355.77	95.07	355.02	26.83	226.70	356.05	361.20
423.00	355.33	353.64	94.31	352.94	26.78	226.34	353.94	359.06
424.00	353.24	351.56	94.01	350.87	26.82	221.99	351.86	356.96
425.00	351.15	349.48	93.54	348.76	26.69	221.92	349.82	354.86
426.00	349.08	347.43	92.87	346.71	26.73	220.42	347.76	352.79
427.00	347.06	345.42	91.96	344.66	26.64	218.08	345.72	350.74
428.00	345.04	343.38	91.43	342.61	26.56	215.40	343.74	348.67
429.00	343.02	341.39	91.13	340.62	26.58	214.54	341.70	346.66
430.00	341.05	339.41	90.52	338.61	26.28	213.97	339.77	344.66
431.00	339.03	337.42	90.61	336.64	26.14	215.56	337.79	342.66
432.00	337.06	335.44	89.95	334.67	26.52	212.32	335.84	340.67
433.00	335.12	333.52	89.17	332.72	26.56	211.31	333.91	338.72
434.00	333.16	331.59	88.97	330.77	26.61	210.68	331.96	336.77
435.00	331.22	329.68	88.71	328.88	26.58	208.81	330.04	334.82
436.00	329.35	327.79	88.06	326.98	26.59	207.43	328.20	332.90
437.00	327.45	325.94	87.37	325.09	26.60	206.16	326.21	331.00
438.00	325.63	324.09	87.33	323.22	26.71	203.77	324.44	329.12
439.00	323.76	322.25	86.62	321.34	26.60	201.07	322.53	327.25
440.00	321.92	320.42	85.96	319.51	26.37	200.59	320.74	325.38

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441.00	320.12	318.58	85.63	317.67	26.30	198.39	318.97	323.54
442.00	318.27	316.77	85.53	315.90	26.05	195.56	317.06	321.72
443.00	316.47	314.97	85.12	314.12	25.77	194.26	315.33	319.88
444.00	314.67	313.18	84.79	312.39	26.14	196.56	313.57	318.08
445.00	312.85	311.41	84.24	310.63	26.31	194.79	311.79	316.26
446.00	311.08	309.64	83.98	308.85	26.36	192.63	310.09	314.46
447.00	309.34	307.91	83.29	307.13	26.43	191.80	308.39	312.70
448.00	307.60	306.19	82.54	305.41	26.32	188.48	306.59	310.94
449.00	305.88	304.48	81.89	303.68	26.14	187.46	304.81	309.19
450.00	304.19	302.81	81.62	302.01	26.18	187.79	303.13	307.49
451.00	302.56	301.14	81.24	300.34	26.22	186.02	301.48	305.81
452.00	300.87	299.47	80.77	298.69	26.12	182.94	299.77	304.08
453.00	299.21	297.82	80.42	297.06	26.01	183.94	298.12	302.42
454.00	297.59	296.17	79.91	295.39	25.91	181.91	296.50	300.75
455.00	295.89	294.54	79.69	293.76	25.96	181.71	294.79	299.08
456.00	294.29	292.93	79.14	292.12	26.01	179.68	293.19	297.46
457.00	292.67	291.34	78.78	290.52	26.01	178.50	291.58	295.84
458.00	291.07	289.73	78.37	288.88	26.01	179.01	290.03	294.22
459.00	289.51	288.15	77.91	287.30	25.94	176.71	288.44	292.62
460.00	287.92	286.59	77.44	285.75	25.81	171.33	286.82	291.01
461.00	286.37	285.03	76.98	284.19	25.75	173.24	285.29	289.42
462.00	284.79	283.47	77.24	282.66	26.04	174.14	283.73	287.86
463.00	283.24	281.93	76.90	281.13	26.06	175.11	282.26	286.30
464.00	281.68	280.40	76.37	279.61	25.95	173.36	280.70	284.73
465.00	280.16	278.86	76.02	278.12	26.21	169.06	279.12	283.16
466.00	278.65	277.36	75.87	276.64	26.22	168.38	277.64	281.63
467.00	277.12	275.84	75.41	275.14	26.01	167.90	276.17	280.11
468.00	275.63	274.37	75.14	273.66	25.77	167.63	274.66	278.61
469.00	274.17	272.91	74.83	272.19	26.06	164.98	273.19	277.12
470.00	272.71	271.46	74.44	270.71	26.01	164.90	271.73	275.63
471.00	271.24	270.02	73.89	269.24	25.92	164.68	270.29	274.17
472.00	269.84	268.58	73.74	267.78	25.83	164.24	268.93	272.71
473.00	268.42	267.18	72.59	266.36	25.94	160.50	267.47	271.26
474.00	267.01	265.77	72.50	264.94	25.97	161.14	266.04	269.84
475.00	265.59	264.37	72.84	263.53	26.06	160.99	264.63	268.43
476.00	264.18	262.98	72.43	262.12	25.97	159.67	263.24	267.01
477.00	262.83	261.62	71.81	260.73	25.92	159.27	261.87	265.61
478.00	261.44	260.25	71.87	259.33	25.88	156.68	260.43	264.22
479.00	260.08	258.88	71.33	257.95	25.83	156.64	259.08	262.83
480.00	258.73	257.53	70.83	256.56	25.79	155.76	257.69	261.47
481.00	257.38	256.18	70.79	255.22	25.68	155.49	256.33	260.09
482.00	256.01	254.84	70.38	253.89	25.64	153.34	254.98	258.73
483.00	254.68	253.51	69.86	252.54	25.62	153.36	253.68	257.38
484.00	253.37	252.18	69.87	251.26	25.48	152.71	252.41	256.04
485.00	252.02	250.84	69.54	249.98	25.47	150.56	251.12	254.68
486.00	250.68	249.53	69.43	248.71	25.54	150.16	249.78	253.34
487.00	249.38	248.23	68.93	247.43	25.40	147.23	248.44	252.02
488.00	248.09	246.96	68.53	246.19	25.37	146.53	247.16	250.74
489.00	246.79	245.67	68.63	244.91	25.51	147.53	245.92	249.44
490.00	245.54	244.40	68.07	243.63	25.56	148.14	244.76	248.16
491.00	244.25	243.16	67.55	242.34	25.59	146.56	243.41	246.87
492.00	243.01	241.91	67.49	241.10	25.45	145.41	242.19	245.60
493.00	241.72	240.66	67.43	239.89	25.03	145.12	240.96	244.33
494.00	240.44	239.39	67.21	238.69	25.37	145.62	239.71	243.05
495.00	239.23	238.16	66.54	237.46	25.52	144.39	238.46	241.79
496.00	238.01	236.96	66.42	236.24	25.53	143.38	237.24	240.57
497.00	236.82	235.75	66.40	235.03	25.60	143.04	236.08	239.36
498.00	235.61	234.56	66.06	233.84	25.57	140.35	234.87	238.13
499.00	234.44	233.38	65.51	232.66	25.59	137.00	233.71	236.93

APPENDIX I

1400 F Second Text File for Fortran Program

1400FRun3_Coefficients

0.0	4.3596	5.3383	-.00106	-125.7307	-202.0671	-94.5148
1.0	4.4414	5.7103	-.00129	-125.7307	-215.5383	-94.5148
2.0	14.6048	17.6433	0.01401	377.1920	730.0490	283.5443
3.0	120.4348	129.0373	0.01572	3685.4799	5923.0925	2770.4641
4.0	252.6270	170.3103	0.01721	7025.2006	3455.0165	5281.0127
5.0	349.7514	102.8681	0.01648	9932.7220	2251.7505	7466.6667
6.0	417.0260	56.8672	0.01492	12800.9527	1810.0325	9622.7848
7.0	463.0474	36.5403	0.01358	15291.9914	1486.2626	11495.3587
8.0	494.9680	26.2892	0.01238	17547.2850	1305.1699	13190.7173
9.0	518.6872	20.6603	0.01137	19543.2593	1104.4856	14691.1393
10.0	537.3246	17.2097	0.01058	21193.4741	954.8999	15931.6456
11.0	553.4143	15.0339	0.00993	22600.0859	859.8637	16989.0296
12.0	569.2725	13.7450	0.00936	23833.8180	795.9345	17916.4557
13.0	581.9836	12.5068	0.00892	24792.5143	708.5825	18637.1309
14.0	595.1851	11.7432	0.00862	25366.1604	625.2956	19068.3545
15.0	607.9370	11.1571	0.00835	25821.9340	576.8116	19410.9705
16.0	622.2284	10.8612	0.00806	26356.2893	535.8784	19812.6583
17.0	635.0484	10.4890	0.00778	26906.3610	495.4117	20226.1604
18.0	648.8630	10.2443	0.00754	27330.7019	461.3642	20545.1477
19.0	664.0264	10.1335	0.00734	27692.1776	438.2444	20816.8777
20.0	677.8818	9.9534	0.00717	27935.7807	416.7446	21000.0001
21.0	691.8735	9.8069	0.00701	28195.1002	399.3326	21194.9368
22.0	706.6826	9.7190	0.00690	28297.2564	375.8490	21271.7300
23.0	721.2057	9.6303	0.00678	28422.9870	364.0343	21366.2448
24.0	735.2927	9.5300	0.00666	28564.4340	350.6990	21472.5739
25.0	749.8157	9.4528	0.00660	28485.8524	329.6338	21413.5022
26.0	765.8134	9.4649	0.00650	28619.4412	326.5196	21513.9241
27.0	795.5114	9.5423	0.00642	28635.1575	314.3075	21525.7385
28.0	824.6336	9.6864	0.00632	28690.1647	303.3321	21567.0887
29.0	853.6925	9.7863	0.00625	28650.8738	298.1188	21537.5528
30.0	884.1560	9.9542	0.00617	28698.0228	288.5673	21572.9958
31.0	914.9363	10.0641	0.00611	28729.4555	281.7687	21596.6245
32.0	946.4954	10.2017	0.00605	28753.0300	276.5157	21614.3461
33.0	978.9190	10.3492	0.00599	28784.4627	267.0999	21637.9747
34.0	1011.3156	10.4860	0.00594	28792.3208	260.9707	21643.8819
35.0	1043.6734	10.5831	0.00590	28776.6045	258.5112	21632.0676
36.0	1076.2340	10.6646	0.00586	28784.4627	253.4711	21637.9747
37.0	1109.1837	10.7991	0.00581	28831.6117	249.7805	21673.4178
38.0	1142.3839	10.9412	0.00577	28847.3280	246.1376	21685.2321
39.0	1176.1173	11.0746	0.00573	28870.9025	243.8764	21702.9536
40.0	1209.3130	11.2020	0.00568	28941.6260	240.3900	21756.1182
41.0	1242.2963	11.2856	0.00565	28941.6260	238.1700	21756.1182
42.0	1276.8666	11.4861	0.00563	28870.9025	234.8607	21702.9536
43.0	1309.6316	11.5324	0.00555	29145.9383	234.2398	21909.7047
44.0	1343.2013	11.6755	0.00555	28965.2005	230.2582	21773.8397
45.0	1376.5316	11.8174	0.00549	29145.9383	228.7052	21909.7047
46.0	1407.8416	11.8550	0.00549	28918.0515	224.4803	21738.3967
47.0	1441.0787	11.9829	0.00541	29216.6618	225.4469	21962.8693
48.0	1473.6209	12.0312	0.00542	29004.4913	222.2756	21803.3756
49.0	1506.7427	12.1180	0.00541	28910.1933	220.7072	21732.4895
50.0	1539.7104	12.2887	0.00536	29130.2220	218.7136	21897.8904
51.0	1571.8333	12.3469	0.00537	28902.3352	215.9218	21726.5823
52.0	1604.3799	12.4682	0.00533	29059.4985	214.6725	21844.7258
53.0	1637.8376	12.5371	0.00534	28894.4770	211.5606	21720.6752
54.0	1668.2723	12.6747	0.00527	29185.2291	213.7590	21939.2406
55.0	1698.6534	12.6723	0.00525	29177.3710	215.4460	21933.3334
56.0	1730.4260	12.8074	0.00529	28863.0443	209.5743	21697.0465
57.0	1761.4598	12.8709	0.00528	28792.3208	208.3213	21643.8819
58.0	1792.5762	12.9573	0.00526	28847.3280	207.2035	21685.2321
59.0	1822.8722	12.9680	0.00523	28973.0587	209.0157	21779.7469
60.0	1853.4647	13.0439	0.00521	28973.0587	208.3393	21779.7469
61.0	1884.1635	13.1627	0.00520	28965.2005	207.3468	21773.8397
62.0	1913.9806	13.2808	0.00518	28965.2005	204.7332	21773.8397

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63.0	1942.0765	13.2943	0.00518	28925.9097	203.7753	21744.3039
64.0	1970.7428	13.3349	0.00518	28839.4698	202.8409	21679.3250
65.0	2000.2244	13.4358	0.00516	28886.6188	201.5267	21714.7680
66.0	2030.2493	13.5641	0.00514	28941.6260	203.2735	21756.1182
67.0	2058.3765	13.5767	0.00515	28870.9025	201.6516	21702.9536
68.0	2085.9264	13.6613	0.00514	28839.4698	198.2700	21679.3250
69.0	2114.3908	13.8261	0.00513	28776.6045	198.2087	21632.0676
70.0	2139.0602	13.7305	0.00513	28737.3137	198.6755	21602.5317
71.0	2167.0429	13.8641	0.00512	28753.0300	197.2012	21614.3461
72.0	2193.1827	13.9196	0.00511	28713.7392	198.0865	21584.8102
73.0	2218.2138	13.9442	0.00511	28635.1575	196.6100	21525.7385
74.0	2243.3694	14.0070	0.00508	28745.1718	199.4038	21608.4389
75.0	2267.5349	14.0101	0.00510	28540.8595	194.7886	21454.8524
76.0	2292.3554	14.0818	0.00512	28399.4125	193.0255	21348.5233
77.0	2316.1363	14.1218	0.00508	28533.0013	195.1345	21448.9452
78.0	2339.5905	14.1412	0.00511	28297.2564	192.7679	21271.7300
79.0	2363.7129	14.2055	0.00510	28336.5472	191.4560	21301.2659
80.0	2387.4959	14.3150	0.00510	28257.9655	191.3848	21242.1942
81.0	2408.8606	14.3181	0.00511	28108.6604	190.0304	21129.9579
82.0	2431.2917	14.3925	0.00509	28163.6675	189.9172	21171.3081
83.0	2454.9003	14.5466	0.00510	28077.2277	189.3627	21106.3292
84.0	2475.2293	14.5099	0.00510	28014.3624	188.4092	21059.0718
85.0	2498.6877	14.6508	0.00509	27998.6460	188.6701	21047.2574
86.0	2520.0484	14.6965	0.00509	27990.7879	188.9425	21041.3503
87.0	2538.8151	14.6081	0.00512	27810.0501	187.2240	20905.4853
88.0	2559.9788	14.6797	0.00510	27872.9154	186.9968	20952.7427
89.0	2580.8337	14.7570	0.00511	27770.7592	187.5487	20875.9494
90.0	2598.9482	14.7198	0.00511	27747.1847	186.3200	20858.2279
91.0	2619.3738	14.8262	0.00513	27566.4469	184.6173	20722.3629
92.0	2636.4897	14.7620	0.00514	27519.2979	183.9320	20686.9199
93.0	2655.7057	14.8134	0.00515	27424.9999	184.0810	20616.0338
94.0	2674.1803	14.8232	0.00514	27456.4326	184.3951	20639.6625
95.0	2695.0734	14.9629	0.00515	27393.5673	185.0639	20592.4051
96.0	2711.6807	14.8948	0.00516	27322.8438	182.8566	20539.2406
97.0	2729.4525	14.9214	0.00518	27212.8294	182.1407	20456.5401
98.0	2748.7508	15.0406	0.00516	27283.5529	182.5122	20509.7047
99.0	2765.4018	15.0480	0.00518	27142.1059	182.4339	20403.3756
100.0	2779.0680	14.9578	0.00518	27047.8079	181.3734	20332.4895
101.0	2796.2093	15.0550	0.00518	27039.9498	181.7065	20326.5823
102.0	2811.9728	15.0722	0.00517	27055.6661	180.7661	20338.3967
103.0	2829.3867	15.1687	0.00518	26953.5099	181.3830	20261.6034
104.0	2846.3938	15.2544	0.00517	27000.6589	182.6082	20297.0465
105.0	2859.5048	15.1662	0.00518	26898.5028	180.1775	20220.2532
106.0	2875.4879	15.2227	0.00519	26835.6375	180.9890	20172.9958
107.0	2888.5085	15.1752	0.00521	26741.3395	180.1033	20102.1098
108.0	2905.3933	15.3036	0.00523	26599.8925	179.9519	19995.7806
109.0	2921.4564	15.4112	0.00521	26662.7578	179.4800	20043.0380
110.0	2932.1347	15.2693	0.00522	26568.4598	178.5448	19972.1520
111.0	2946.3080	15.3263	0.00521	26623.4670	179.7601	20013.5022
112.0	2960.8748	15.3958	0.00522	26537.0271	177.6504	19948.5233
113.0	2972.7857	15.3527	0.00520	26599.8925	177.4049	19995.7806
114.0	2988.3079	15.4830	0.00522	26474.1618	178.2372	19901.2659
115.0	3000.1750	15.4454	0.00523	26411.2965	176.9403	19854.0085
116.0	3012.9915	15.4631	0.00524	26356.2893	177.8694	19812.6583
117.0	3025.8090	15.4790	0.00525	26324.8567	177.1525	19789.0296
118.0	3040.0587	15.5776	0.00523	26364.1475	178.6256	19818.5655
119.0	3049.3709	15.4882	0.00526	26214.8423	177.0343	19706.3292
120.0	3060.9717	15.5078	0.00526	26206.9842	177.0476	19700.4220
121.0	3072.4084	15.5198	0.00526	26159.8352	173.8965	19664.9790
122.0	3084.2786	15.5610	0.00525	26230.5587	176.6830	19718.1435
123.0	3096.8928	15.6347	0.00527	26081.2535	176.0529	19605.9072
124.0	3106.7925	15.5924	0.00527	26096.9698	175.5467	19617.7216
125.0	3115.7237	15.5346	0.00529	25994.8137	175.0623	19540.9283

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126.0	3130.4929	15.7276	0.00530	25908.3738	174.1804	19475.9494
127.0	3142.2632	15.8022	0.00530	25869.0830	175.1329	19446.4136
128.0	3150.5791	15.7490	0.00532	25782.6432	174.0633	19381.4347
129.0	3158.8120	15.6912	0.00530	25861.2249	173.9414	19440.5064
130.0	3170.5919	15.7937	0.00531	25751.2105	174.3809	19357.8060
131.0	3179.5473	15.7798	0.00532	25743.3524	175.0918	19351.8988
132.0	3189.0403	15.7886	0.00532	25688.3452	172.6045	19310.5486
133.0	3198.6141	15.8047	0.00533	25641.1962	173.0110	19275.1055
134.0	3206.8786	15.8134	0.00533	25617.6217	173.5676	19257.3840
135.0	3214.8115	15.7855	0.00534	25546.8982	173.6965	19204.2195
136.0	3225.7794	15.8784	0.00532	25617.6217	174.5070	19257.3840
137.0	3233.7190	15.8472	0.00534	25499.7492	172.4186	19168.7764
138.0	3244.5609	15.9329	0.00532	25594.0472	171.9966	19239.6625
139.0	3256.8820	16.0363	0.00530	25696.2034	174.5798	19316.4558
140.0	3268.6503	15.9793	0.00530	25704.0615	175.8745	19322.3629
141.0	3279.1795	15.9579	0.00528	25790.5014	177.0582	19387.3418
142.0	3290.2649	16.0370	0.00528	25735.4942	175.5158	19345.9916
143.0	3300.7573	15.9895	0.00528	25727.6360	175.6019	19340.0844
144.0	3311.0039	15.9900	0.00526	25837.6504	173.3359	19422.7849
145.0	3321.2797	16.0466	0.00527	25727.6360	173.8288	19340.0844
146.0	3332.0056	16.0802	0.00524	25845.5085	173.9527	19428.6920
147.0	3342.1050	16.1039	0.00525	25806.2177	176.0315	19399.1562
148.0	3354.3086	16.2240	0.00523	25853.3667	176.5270	19434.5992
149.0	3365.7069	16.1878	0.00522	25939.8065	177.4673	19499.5781
150.0	3375.6155	16.1119	0.00523	25892.6575	176.9900	19464.1351
151.0	3385.1800	16.2428	0.00522	25876.9412	174.9756	19452.3207
152.0	3394.0431	16.2502	0.00519	26010.5300	176.5088	19552.7427
153.0	3402.7385	16.1954	0.00522	25821.9340	175.0837	19410.9705
154.0	3412.0422	16.2126	0.00520	25900.5157	177.6103	19470.0422
155.0	3421.9395	16.3235	0.00517	26010.5300	176.8755	19552.7427
156.0	3429.8123	16.3342	0.00520	25814.0759	173.7412	19405.0633
157.0	3438.1513	16.3113	0.00519	25837.6504	175.9791	19422.7849
158.0	3448.7716	16.4010	0.00518	25900.5157	175.4249	19470.0422
159.0	3459.5186	16.4617	0.00518	25908.3738	175.9084	19475.9494
160.0	3470.1028	16.5186	0.00518	25916.2320	175.0440	19481.8566
161.0	3479.6116	16.4989	0.00516	26010.5300	177.4117	19552.7427
162.0	3488.2509	16.4592	0.00515	26057.6790	175.9927	19588.1857
163.0	3495.4497	16.4054	0.00517	25924.0902	176.6682	19487.7638
164.0	3503.6722	16.4509	0.00518	25892.6575	176.3538	19464.1351
165.0	3513.0652	16.5954	0.00515	26010.5300	175.7204	19552.7427
166.0	3521.1942	16.6024	0.00514	26049.8208	176.3565	19582.2785
167.0	3527.8928	16.5620	0.00516	25916.2320	176.6146	19481.8566
168.0	3533.7358	16.4513	0.00517	25845.5085	176.5873	19428.6920
169.0	3540.5152	16.5166	0.00519	25735.4942	173.6864	19345.9916
170.0	3547.8564	16.5770	0.00518	25727.6360	174.5627	19340.0844
171.0	3555.3420	16.6219	0.00519	25680.4870	174.5586	19304.6414
172.0	3562.3086	16.6502	0.00519	25656.9125	175.1059	19286.9199
173.0	3569.7524	16.6517	0.00520	25617.6217	173.4828	19257.3840
174.0	3578.7733	16.7398	0.00520	25617.6217	175.6637	19257.3840
175.0	3585.7776	16.6815	0.00522	25539.0400	174.0441	19198.3123
176.0	3593.3007	16.7303	0.00522	25531.1819	173.3278	19192.4051
177.0	3600.4962	16.7465	0.00523	25507.6074	173.2331	19174.6836
178.0	3606.7007	16.7282	0.00526	25326.8696	172.4741	19038.8186
179.0	3611.6352	16.6888	0.00528	25240.4297	173.6727	18973.8397
180.0	3618.5108	16.7873	0.00529	25153.9899	169.4442	18908.8608
181.0	3627.2928	16.9504	0.00526	25311.1532	174.2059	19027.0043
182.0	3633.9116	16.9102	0.00528	25208.9971	172.9473	18950.2110
183.0	3639.5818	16.8747	0.00527	25264.0042	171.5398	18991.5612
184.0	3645.3690	16.8382	0.00526	25264.0042	171.7861	18991.5612
185.0	3652.6881	16.9162	0.00526	25271.8624	171.5091	18997.4684
186.0	3658.0829	16.8476	0.00528	25201.1389	172.8407	18944.3039
187.0	3663.3527	16.8189	0.00530	25075.4082	172.4383	18849.7891
188.0	3669.5841	16.8915	0.00531	25028.2592	170.8025	18814.3460

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189.0	3674.7307	16.8708	0.00529	25106.8409	171.1376	18873.4178
190.0	3681.9533	16.9976	0.00530	25091.1246	172.5266	18861.6034
191.0	3688.0683	16.9328	0.00531	25043.9756	171.2994	18826.1604
192.0	3692.6597	16.9397	0.00533	24933.9612	170.6961	18743.4600
193.0	3697.5755	17.0321	0.00533	24878.9541	171.3951	18702.1098
194.0	3702.7905	16.9827	0.00533	24902.5286	171.6298	18719.8313
195.0	3708.6748	16.9936	0.00534	24855.3796	169.4813	18684.3882
196.0	3714.2613	16.9451	0.00532	24965.3939	171.5507	18767.0887
197.0	3719.9565	17.0163	0.00532	24973.2521	171.6637	18772.9958
198.0	3725.0599	17.0120	0.00532	24918.2449	170.7704	18731.6456
199.0	3730.1459	17.0434	0.00533	24871.0959	170.2269	18696.2026
200.0	3735.7620	17.1439	0.00531	24973.2521	170.0532	18772.9958
201.0	3739.0559	17.0258	0.00532	24910.3867	173.8608	18725.7384
202.0	3743.3523	17.0514	0.00535	24761.0816	170.5570	18613.5022
203.0	3747.4419	17.0748	0.00535	24768.9398	171.1022	18619.4093
204.0	3750.7388	17.0363	0.00538	24619.6346	170.2733	18507.1730
205.0	3755.1279	17.0477	0.00538	24619.6346	170.8379	18507.1730
206.0	3760.5104	17.1326	0.00540	24501.7621	169.8104	18418.5655
207.0	3765.0411	17.0759	0.00540	24525.3366	169.0431	18436.2870
208.0	3769.9032	17.0932	0.00541	24478.1876	169.2626	18400.8439
209.0	3775.5759	17.1466	0.00541	24509.6203	169.0189	18424.4726
210.0	3778.5122	17.0297	0.00544	24352.4569	164.9337	18306.3292
211.0	3780.4779	16.9562	0.00548	24163.8610	164.9098	18164.5570
212.0	3783.8667	16.9862	0.00548	24179.5773	165.3681	18176.3714
213.0	3787.8829	17.0293	0.00547	24203.1518	161.8699	18194.0929
214.0	3791.6429	16.9970	0.00545	24266.0171	163.4381	18241.3503
215.0	3795.4598	17.0115	0.00545	24289.5916	163.5296	18259.0718
216.0	3798.0289	17.0260	0.00549	24061.7048	165.5369	18087.7638
217.0	3801.3552	17.0809	0.00551	23943.8323	165.2375	17999.1562
218.0	3804.1803	17.0936	0.00555	23802.3853	160.6882	17892.8271
219.0	3807.5046	17.0630	0.00554	23849.5343	162.3031	17928.2701
220.0	3811.9288	17.0968	0.00554	23888.8251	161.9642	17957.8060
221.0	3816.1594	17.1039	0.00558	23700.2292	160.4499	17816.0338
222.0	3819.6475	17.1029	0.00557	23755.2363	160.3218	17857.3840
223.0	3822.8004	17.0775	0.00564	23425.1933	161.6769	17609.2827
224.0	3825.9143	17.1207	0.00565	23433.0515	160.8554	17615.1899
225.0	3827.7497	17.1077	0.00572	23150.1575	159.5157	17402.5317
226.0	3830.6378	17.1070	0.00572	23150.1575	158.9862	17402.5317
227.0	3833.2709	17.1014	0.00572	23165.8739	156.7851	17414.3460
228.0	3836.0983	17.0835	0.00571	23213.0229	156.4864	17449.7891
229.0	3841.0890	17.1341	0.00577	22859.4054	156.1672	17183.9663
230.0	3841.3787	17.1235	0.00573	23071.5759	156.0061	17343.4600
231.0	3844.8897	17.1286	0.00578	22804.3982	157.6462	17142.6161
232.0	3846.7527	17.1956	0.00578	22835.8309	156.4336	17166.2448
233.0	3848.7364	17.1156	0.00574	23040.1432	155.9811	17319.8313
234.0	3856.8315	17.2501	0.00580	22741.5329	152.5822	17095.3587
235.0	3856.9283	17.1826	0.00576	22914.4125	157.1993	17225.3165
236.0	3857.9128	17.2079	0.00582	22639.3767	156.0858	17018.5654
237.0	3861.3248	17.1015	0.00584	22568.6532	152.9329	16965.4009
238.0	3862.7205	17.1511	0.00581	22710.1002	154.6775	17071.7300
239.0	3865.5456	17.1662	0.00585	22537.2206	154.8595	16941.7722
240.0	3867.9795	17.1864	0.00587	22497.9297	154.0485	16912.2363
241.0	3870.7856	17.2303	0.00588	22427.2062	155.6724	16859.0718
242.0	3871.8705	17.1435	0.00589	22395.7736	153.7115	16835.4431
243.0	3874.7700	17.1788	0.00587	22497.9297	152.4939	16912.2363
244.0	3878.2789	17.2491	0.00590	22364.3409	154.0715	16811.8144
245.0	3880.0814	17.2240	0.00590	22395.7736	150.8359	16835.4431
246.0	3883.1360	17.2750	0.00587	22474.3552	149.0287	16894.5148
247.0	3885.3223	17.2502	0.00589	22395.7736	154.5365	16835.4431
248.0	3888.3469	17.2500	0.00582	22655.0931	153.1267	17030.3798
249.0	3891.0289	17.1747	0.00580	22765.1074	156.3060	17113.0802
250.0	3893.6730	17.2126	0.00582	22686.5257	155.3162	17054.0085
251.0	3897.3551	17.2751	0.00579	22796.5400	156.2953	17136.7089

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252.0	3897.8841	17.2231	0.00578	22804.3982	156.6415	17142.6161
253.0	3900.4642	17.2197	0.00580	22725.8166	155.3371	17083.5444
254.0	3903.8897	17.2620	0.00576	22906.5544	155.7327	17219.4093
255.0	3906.7080	17.2651	0.00579	22812.2564	154.6477	17148.5233
256.0	3907.5228	17.2848	0.00582	22670.8094	155.7596	17042.1941
257.0	3908.4868	17.2848	0.00586	22490.0716	154.5827	16906.3292
258.0	3910.4469	17.3080	0.00587	22474.3552	152.8232	16894.5148
259.0	3912.5079	17.2577	0.00585	22552.9369	156.4848	16953.5865
260.0	3915.0652	17.3263	0.00585	22545.0787	153.8446	16947.6794
261.0	3916.0030	17.3143	0.00584	22600.0859	154.2492	16989.0296
262.0	3916.6577	17.2654	0.00581	22623.6604	154.8152	17006.7511
263.0	3918.0434	17.2567	0.00578	22804.3982	154.1937	17142.6161
264.0	3918.9663	17.2367	0.00581	22639.3767	153.6262	17018.5654
265.0	3919.9888	17.2391	0.00581	22662.9512	155.0664	17036.2870
266.0	3921.1972	17.2394	0.00581	22655.0931	153.0003	17030.3798
267.0	3923.1141	17.2592	0.00582	22592.2277	154.7943	16983.1224
268.0	3925.0802	17.2784	0.00580	22678.6676	155.7601	17048.1013
269.0	3926.4293	17.2624	0.00581	22623.6604	155.0687	17006.7511
270.0	3928.4063	17.2812	0.00582	22607.9441	155.6068	16994.9368
271.0	3930.9839	17.3269	0.00582	22592.2277	156.4739	16983.1224
272.0	3932.7251	17.3690	0.00583	22568.6532	154.2101	16965.4009
273.0	3933.5694	17.3031	0.00584	22537.2206	154.2061	16941.7722
274.0	3935.9476	17.3645	0.00585	22497.9297	154.7668	16912.2363
275.0	3938.8367	17.3751	0.00586	22466.4971	152.9547	16888.6076
276.0	3941.3580	17.3560	0.00591	22293.6174	152.7018	16758.6498
277.0	3943.0572	17.3427	0.00584	22576.5114	154.9284	16971.3081
278.0	3944.4186	17.3225	0.00584	22545.0787	155.0319	16947.6794
279.0	3944.7868	17.3325	0.00588	22348.6246	153.1135	16800.0000
280.0	3944.7685	17.3227	0.00583	22576.5114	156.1608	16971.3081
281.0	3945.5120	17.3412	0.00583	22537.2206	151.8567	16941.7722
282.0	3946.3166	17.3753	0.00589	22332.9082	155.3173	16788.1857
283.0	3946.9402	17.3878	0.00588	22325.0501	156.3318	16782.2785
284.0	3946.6965	17.3536	0.00586	22411.4899	154.7042	16847.2574
285.0	3948.3387	17.3604	0.00587	22364.3409	155.3559	16811.8144
286.0	3950.1692	17.3536	0.00587	22387.9154	156.5832	16829.5359
287.0	3951.2833	17.3976	0.00592	22222.8939	155.8468	16705.4853
288.0	3951.7322	17.3707	0.00594	22152.1704	153.0433	16652.3207
289.0	3953.2019	17.3750	0.00596	22097.1633	153.5295	16610.9705
290.0	3955.1390	17.4466	0.00597	22065.7306	152.7216	16587.3418
291.0	3956.1783	17.4371	0.00600	21955.7163	151.9485	16504.6414
292.0	3957.6080	17.4879	0.00599	21995.0071	153.4476	16534.1773
293.0	3957.6474	17.4842	0.00601	21892.8509	153.6340	16457.3840
294.0	3957.0780	17.4099	0.00602	21829.9856	152.4085	16410.1266
295.0	3957.3471	17.3538	0.00603	21814.2693	149.8290	16398.3123
296.0	3959.6277	17.4292	0.00608	21649.2478	153.8378	16274.2616
297.0	3960.0041	17.4058	0.00608	21641.3896	150.5255	16268.3545
298.0	3906.8919	17.1836	0.00637	19873.3022	135.7775	14939.2405
299.0	3552.3504	15.7726	0.00662	13508.1876	90.1414	10154.4304
300.0	3252.8062	14.8526	0.00583	9893.4312	66.4509	7437.1308
301.0	3063.1129	14.4146	0.00471	8148.9183	55.3115	6125.7384
302.0	2948.8739	14.2103	0.00368	7205.9384	49.5518	5416.8777
303.0	2864.2034	14.1948	0.00296	6451.5544	44.5943	4849.7890
304.0	2793.5338	14.0827	0.00252	5807.1848	40.6192	4365.4009
305.0	2736.4100	14.0834	0.00223	5249.2550	35.9511	3945.9916
306.0	2682.8677	13.9652	0.00214	4628.4599	31.6644	3479.3249
307.0	2636.6168	13.9323	0.00209	4109.8209	28.4537	3089.4515
308.0	2593.5286	13.8951	0.00213	3489.0258	23.8847	2622.7848
309.0	2552.4637	13.8257	0.00203	3190.4155	22.2415	2398.3122
310.0	2515.9563	13.8303	0.00184	3056.8266	21.1887	2297.8903
311.0	2479.2429	13.7265	0.00162	2679.6347	18.4379	2014.3460
312.0	2446.1472	13.7009	0.00167	1995.9742	13.1636	1500.4219
313.0	2414.9419	13.6232	0.00182	1665.9312	11.0266	1252.3207
314.0	2385.8332	13.5094	0.00215	1548.0587	10.5641	1163.7131

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315.0	2360.4569	13.5265	0.00325	1131.5759	7.4988	850.6329
316.0	2334.1324	13.4826	0.00400	974.4126	6.4707	732.4895
317.0	2308.7219	13.4851	0.00353	1225.8739	8.0759	921.5190
318.0	2281.3654	13.3970	0.00343	1445.9026	9.4158	1086.9198
319.0	2255.8910	13.4333	0.00379	1398.7536	9.0920	1051.4768
320.0	2228.9772	13.3828	0.00361	1563.7751	10.2846	1175.5274
321.0	2200.6391	13.2800	0.00393	1532.3424	10.0128	1151.8987
322.0	2175.0849	13.3223	0.00375	1665.9312	10.7622	1252.3207
323.0	2147.9891	13.2728	0.00360	1775.9456	11.4503	1335.0211
324.0	2119.4404	13.1529	0.00372	1752.3711	11.3667	1317.2996
325.0	2092.1779	13.1061	0.00390	1720.9384	10.9719	1293.6709
326.0	2064.2511	13.0127	0.00352	1948.8252	12.4011	1464.9789
327.0	2037.9404	13.0187	0.00386	1815.2364	11.6781	1364.5570
328.0	2008.9788	12.8905	0.00362	1995.9742	12.6854	1500.4219
329.0	1983.2742	12.8896	0.00381	1909.5344	12.2067	1435.4430
330.0	1956.8390	12.8406	0.00375	2003.8324	12.6349	1506.3291
331.0	1930.2006	12.7762	0.00417	1807.3782	11.3454	1358.6498
332.0	1904.5875	12.7573	0.00416	1823.0946	11.4412	1370.4641
333.0	1878.0539	12.6464	0.00391	1956.6834	12.3697	1470.8861
334.0	1853.2371	12.6352	0.00385	1988.1160	12.4016	1494.5148
335.0	1827.8111	12.5685	0.00377	2035.2650	12.7443	1529.9578
336.0	1802.4264	12.4630	0.00387	2027.4069	12.9057	1524.0506
337.0	1777.2837	12.4045	0.00389	2043.1232	12.8868	1535.8650
338.0	1753.6738	12.3959	0.00383	2074.5559	13.2226	1559.4937
339.0	1728.3392	12.2945	0.00388	2066.6977	13.1530	1553.5865
340.0	1705.0100	12.3071	0.00386	2058.8395	13.1322	1547.6793
341.0	1681.5293	12.2476	0.00383	2082.4140	13.5139	1565.4008
342.0	1656.5719	12.1361	0.00417	1909.5344	12.1691	1435.4430
343.0	1634.6301	12.1614	0.00397	1988.1160	12.4521	1494.5148
344.0	1612.0405	12.1125	0.00370	2121.7049	13.4219	1594.9367
345.0	1589.7219	12.0581	0.00357	2239.5774	13.9804	1683.5443
346.0	1565.7986	11.8861	0.00370	2113.8467	13.3366	1589.0295
347.0	1544.4958	11.8665	0.00324	2436.0315	15.3327	1831.2236
348.0	1524.3787	11.9149	0.00328	2412.4570	15.2655	1813.5021
349.0	1502.4486	11.8272	0.00339	2294.5845	14.4097	1724.8945
350.0	1481.3478	11.7417	0.00329	2365.3080	14.9048	1778.0591
351.0	1461.3939	11.7381	0.00327	2373.1662	15.0216	1783.9662
352.0	1440.1479	11.6349	0.00315	2436.0315	15.3017	1831.2236
353.0	1420.0327	11.5596	0.00314	2412.4570	15.2848	1813.5021
354.0	1400.0254	11.4720	0.00310	2451.7478	15.5016	1843.0380
355.0	1379.8492	11.3703	0.00308	2451.7478	15.7382	1843.0380
356.0	1359.9209	11.2313	0.00324	2318.1590	15.4384	1742.6160
357.0	1341.1875	11.2285	0.00337	2247.4355	14.8809	1689.4515
358.0	1321.6118	11.1670	0.00346	2184.5702	14.2959	1642.1941
359.0	1303.9904	11.1808	0.00338	2216.0029	14.4031	1665.8228
360.0	1285.9241	11.1260	0.00339	2192.4284	14.0510	1648.1013
361.0	1268.7296	11.1297	0.00323	2286.7264	14.5935	1718.9873
362.0	1251.8720	11.1206	0.00319	2278.8682	14.7457	1713.0802
363.0	1233.8899	10.9951	0.00308	2349.5917	15.2417	1766.2447
364.0	1217.3990	10.9896	0.00300	2396.7407	15.3315	1801.6878
365.0	1201.2356	10.9613	0.00285	2514.6132	16.3057	1890.2954
366.0	1184.6215	10.8770	0.00281	2530.3295	16.4047	1902.1097
367.0	1167.5335	10.7568	0.00285	2475.3223	16.2892	1860.7595
368.0	1151.9494	10.7297	0.00279	2491.0387	16.0851	1872.5738
369.0	1135.5018	10.6160	0.00284	2420.3152	16.2045	1819.4093
370.0	1119.8959	10.5700	0.00276	2475.3223	16.7856	1860.7595
371.0	1104.5812	10.5494	0.00281	2436.0315	16.3255	1831.2236
372.0	1090.0231	10.5350	0.00267	2514.6132	16.4473	1890.2954
373.0	1075.6677	10.5246	0.00262	2546.0458	16.7009	1913.9241
374.0	1061.2398	10.4837	0.00255	2585.3367	16.9432	1943.4599
375.0	1046.9844	10.4368	0.00255	2585.3367	16.9778	1943.4599
376.0	1032.7263	10.3913	0.00248	2624.6275	17.3625	1972.9958
377.0	1019.4927	10.4071	0.00240	2695.3510	17.6314	2026.1603

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378.0	1005.9331	10.3521	0.00223	2860.3725	18.7333	2150.2110
379.0	992.1979	10.2718	0.00223	2852.5143	18.9893	2144.3038
380.0	978.4633	10.1659	0.00217	2915.3796	19.4929	2191.5612
381.0	964.8913	10.0842	0.00228	2766.0745	18.8832	2079.3249
382.0	951.9763	10.0525	0.00227	2742.5000	18.6501	2061.6034
383.0	938.9473	9.9853	0.00232	2671.7765	18.2325	2008.4388
384.0	926.7081	9.9658	0.00230	2687.4928	18.4510	2020.2532
385.0	914.3110	9.9106	0.00221	2750.3582	18.8999	2067.5106
386.0	902.0453	9.8351	0.00221	2718.9255	18.4877	2043.8819
387.0	889.7859	9.7558	0.00233	2577.4785	17.7614	1937.5527
388.0	878.0107	9.7245	0.00236	2538.1877	17.5222	1908.0169
389.0	866.6288	9.7150	0.00240	2514.6132	17.3575	1890.2954
390.0	855.7723	9.7265	0.00234	2553.9040	17.5828	1919.8312
391.0	843.7380	9.5946	0.00233	2546.0458	17.6591	1913.9241
392.0	832.6053	9.5391	0.00241	2436.0315	17.0491	1831.2236
393.0	821.5418	9.4733	0.00245	2396.7407	16.6158	1801.6878
394.0	810.9739	9.4556	0.00241	2420.3152	16.8422	1819.4093
395.0	800.5717	9.4382	0.00246	2357.4498	16.7340	1772.1519
396.0	790.0999	9.4134	0.00248	2333.8754	16.5837	1754.4304
397.0	780.2207	9.4078	0.00236	2420.3152	17.2592	1819.4093
398.0	769.9939	9.3528	0.00248	2302.4427	16.6148	1730.8017
399.0	759.4060	9.2560	0.00243	2333.8754	16.7396	1754.4304
400.0	750.2968	9.3031	0.00242	2326.0172	16.6072	1748.5232
401.0	742.9357	9.2036	0.00238	2341.7335	16.7613	1760.3376
402.0	737.9630	9.2271	0.00246	2255.2937	16.3691	1695.3587
403.0	732.3908	9.1746	0.00241	2310.3009	16.8909	1736.7089
404.0	727.0503	9.1613	0.00255	2168.8539	15.9814	1630.3798
405.0	723.0585	9.2181	0.00270	2058.8395	15.1509	1547.6793
406.0	720.2792	9.3354	0.00274	1995.9742	14.6213	1500.4219
407.0	714.9251	9.2948	0.00265	2058.8395	15.0665	1547.6793
408.0	709.5845	9.2743	0.00263	2035.2650	15.0050	1529.9578
409.0	706.0287	9.3280	0.00256	2090.2722	15.2934	1571.3080
410.0	703.0723	9.4168	0.00247	2145.2794	15.9593	1612.6582
411.0	698.5764	9.4346	0.00253	2090.2722	15.6829	1571.3080
412.0	692.4457	9.3356	0.00243	2168.8539	16.4515	1630.3798
413.0	689.4348	9.4271	0.00244	2129.5630	16.0091	1600.8439
414.0	685.7837	9.4663	0.00243	2153.1375	16.3875	1618.5654
415.0	682.3504	9.5219	0.00239	2153.1375	16.2256	1618.5654
416.0	677.5548	9.4970	0.00232	2192.4284	16.6563	1648.1013
417.0	673.0045	9.5132	0.00235	2153.1375	16.5583	1618.5654
418.0	668.7402	9.5187	0.00230	2200.2865	16.7464	1654.0084
419.0	663.7948	9.5556	0.00235	2137.4212	16.4762	1606.7511
420.0	661.7376	9.6183	0.00237	2113.8467	16.2764	1589.0295
421.0	656.0564	9.5173	0.00247	2019.5487	15.8860	1518.1435
422.0	652.6232	9.5638	0.00248	2003.8324	15.4916	1506.3291
423.0	649.2309	9.6143	0.00252	1964.5415	15.3968	1476.7933
424.0	644.8304	9.5973	0.00251	1964.5415	15.1280	1476.7933
425.0	640.8250	9.5868	0.00262	1878.1017	14.6835	1411.8143
426.0	637.4054	9.6374	0.00264	1870.2435	14.6865	1405.9072
427.0	634.6125	9.7159	0.00260	1885.9599	14.7751	1417.7215
428.0	630.8250	9.7241	0.00263	1838.8109	14.3278	1382.2785
429.0	626.6153	9.7074	0.00260	1862.3854	14.6459	1400.0000
430.0	623.2229	9.7016	0.00265	1815.2364	14.4295	1364.5570
431.0	618.1004	9.5879	0.00275	1752.3711	14.3363	1317.2996
432.0	614.8443	9.6928	0.00278	1728.7966	13.9965	1299.5781
433.0	611.9833	9.7744	0.00278	1720.9384	14.0377	1293.6709
434.0	607.6781	9.7445	0.00284	1689.5057	13.9309	1270.0422
435.0	603.5365	9.7144	0.00286	1673.7894	13.8063	1258.2279
436.0	600.4166	9.7682	0.00290	1626.6404	13.4693	1222.7848
437.0	597.4602	9.8320	0.00268	1760.2292	14.6631	1323.2068
438.0	592.9507	9.7820	0.00276	1681.6476	13.9357	1264.1350
439.0	590.0897	9.8312	0.00268	1736.6547	14.2987	1305.4852
440.0	587.1470	9.8542	0.00277	1665.9312	13.8654	1252.3207

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441.0	583.4277	9.8340	0.00281	1618.7822	13.4252	1216.8776
442.0	579.1907	9.7370	0.00268	1713.0802	14.0994	1287.7637
443.0	575.7166	9.7013	0.00284	1603.0659	13.2400	1205.0633
444.0	572.0926	9.7543	0.00292	1555.9169	13.2978	1169.6203
445.0	568.9728	9.8221	0.00303	1493.0516	12.7605	1122.3629
446.0	565.1853	9.8075	0.00319	1406.6117	11.9751	1057.3840
447.0	562.5696	9.8928	0.00335	1335.8882	11.4576	1004.2194
448.0	560.1036	9.9613	0.00313	1422.3281	12.0423	1069.1983
449.0	557.4198	9.9996	0.00291	1516.6261	12.9240	1140.0844
450.0	553.9048	9.9903	0.00292	1500.9097	13.0124	1128.2700
451.0	550.6896	10.0075	0.00285	1516.6261	13.1348	1140.0844
452.0	547.6378	10.0208	0.00275	1555.9169	13.3180	1169.6203
453.0	544.3954	10.0052	0.00275	1548.0587	13.5590	1163.7131
454.0	541.5616	10.0279	0.00273	1540.2006	13.4411	1157.8059
455.0	538.0058	10.0125	0.00271	1563.7751	13.8292	1175.5274
456.0	535.3900	10.0763	0.00271	1555.9169	13.7078	1169.6203
457.0	532.2974	10.0878	0.00275	1532.3424	13.5506	1151.8987
458.0	529.3410	10.1094	0.00286	1469.4771	13.2359	1104.6414
459.0	526.5209	10.1308	0.00274	1508.7679	13.5040	1134.1772
460.0	523.7144	10.1419	0.00265	1548.0587	13.4038	1163.7131
461.0	520.9760	10.1698	0.00265	1532.3424	13.6762	1151.8987
462.0	516.4801	10.0864	0.00272	1500.9097	13.6958	1128.2700
463.0	513.5101	10.1007	0.00293	1390.8954	12.9815	1045.5696
464.0	510.9488	10.1334	0.00291	1390.8954	12.9580	1045.5696
465.0	507.9652	10.1978	0.00270	1477.3352	13.4235	1110.5485
466.0	504.6001	10.1643	0.00279	1422.3281	13.0170	1069.1983
467.0	501.9843	10.1628	0.00296	1343.7464	12.4115	1010.1266
468.0	498.9734	10.1064	0.00290	1367.3209	12.7747	1027.8481
469.0	496.0716	10.1712	0.00286	1375.1791	12.7076	1033.7553
470.0	493.3740	10.1878	0.00281	1383.0372	12.9464	1039.6625
471.0	491.1397	10.2380	0.00290	1343.7464	12.7235	1010.1266
472.0	487.9245	10.1840	0.00296	1288.7393	12.3108	968.7764
473.0	487.1888	10.4435	0.00283	1335.8882	12.4882	1004.2194
474.0	483.9327	10.4009	0.00275	1367.3209	13.0345	1027.8481
475.0	479.6276	10.2509	0.00278	1359.4627	13.1173	1021.9409
476.0	477.1617	10.2714	0.00283	1328.0301	12.8216	998.3122
477.0	475.2679	10.3582	0.00274	1351.6046	13.1728	1016.0338
478.0	471.7121	10.2583	0.00257	1438.0444	13.8614	1081.0127
479.0	469.6277	10.3215	0.00259	1414.4699	13.8087	1063.2911
480.0	467.5024	10.3800	0.00248	1469.4771	14.4161	1104.6414
481.0	464.2326	10.2921	0.00243	1485.1934	14.7284	1116.4557
482.0	461.8757	10.3225	0.00249	1453.7607	14.3024	1092.8270
483.0	459.8594	10.3962	0.00255	1406.6117	14.0202	1057.3840
484.0	456.5352	10.2849	0.00261	1359.4627	13.6348	1021.9409
485.0	454.0147	10.3029	0.00276	1280.8811	12.7380	962.8692
486.0	451.0039	10.2747	0.00279	1273.0229	12.7785	956.9620
487.0	449.0012	10.3153	0.00263	1335.8882	13.1998	1004.2194
488.0	446.8214	10.3511	0.00269	1312.3137	13.0405	986.4979
489.0	443.3881	10.2821	0.00286	1233.7321	12.5401	927.4262
490.0	441.6170	10.3869	0.00311	1115.8596	11.5493	838.8186
491.0	439.7506	10.4800	0.00294	1186.5831	12.2511	891.9831
492.0	436.7670	10.3882	0.00301	1147.2923	11.8542	862.4473
493.0	433.8106	10.2327	0.00322	1076.5688	11.2325	809.2827
494.0	431.2084	10.3050	0.00334	1037.2779	11.0238	779.7468
495.0	429.7779	10.4781	0.00310	1100.1433	11.6960	827.0042
496.0	427.0668	10.4431	0.00317	1076.5688	11.4698	809.2827
497.0	424.1376	10.3955	0.00326	1037.2779	11.1482	779.7468
498.0	421.9851	10.4222	0.00319	1052.9943	11.1408	791.5612
499.0	420.3911	10.5332	0.00322	1029.4198	10.6443	773.8397